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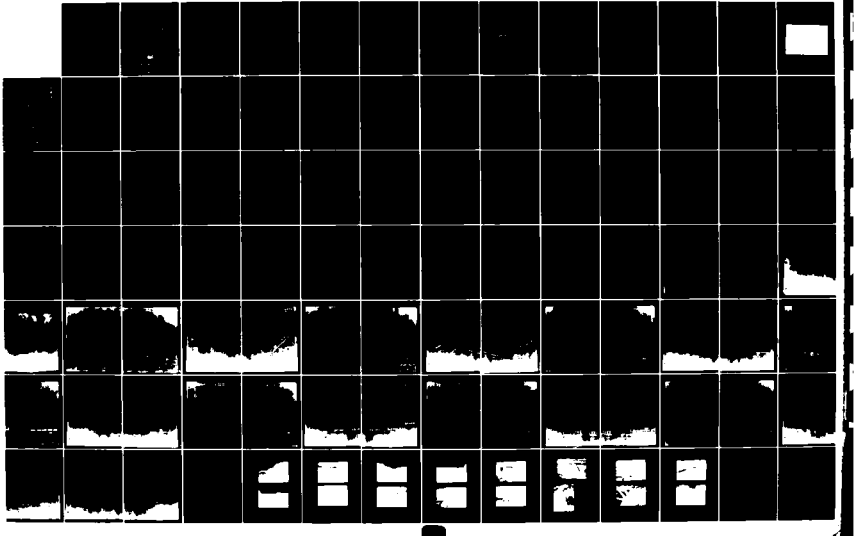

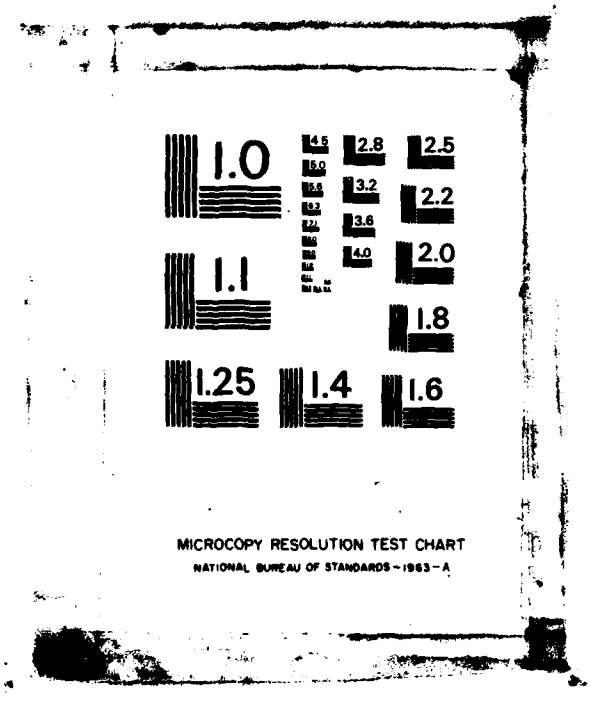
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CONNECTICUT RIVER BASIN

FARMINGTON/WEST HARTFORD, CONNECTICUT

SOUTH RESERVOIR DAM

DAM CT 00487

DIKE CT 01709

PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

MAY, 1981

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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4. TITLE (and Subtitle) South Reservoir Dam DAM: DIKE: NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,
Connecticut River Basin
Farmington/West Hartford, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This flood control project consists of a dam and dike which are earth embankments at 3H:1V with good grass cover and a top width of 12 feet. Thd dam is approximately 3060 feet long and 31 feet high. The dike is approximately 475 feet long and 28 feet high. Based on the visual inspection, review of design information, and past operational performance, the dam and dike are judged to be in GOOD condition. The dam and dike are classified as SMALL in size and HIGH hazard potental structures. The test flood is the PMF.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:

NEDED

JUL 09 1981

Honorable William A. O'Neill
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor O'Neill:

Inclosed is a copy of the South Reservoir Dam (CT-00487) and South Reservoir Dike (CT-01709) Phase I Inspection Report, prepared under the National Program for Inspection of Non-Federal Dams. This report is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. I approve the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is vitally important.

Copies of this report have been forwarded to the Department of Environmental Protection. Copies will be available to the public in thirty days.

I wish to thank you and the Department of Environmental Protection for your cooperation in this program.

Sincerely,

C. E. EDGAR, III
Colonel, Corps of Engineers
Commander and Division Engineer

Incl
As stated

CONNECTICUT RIVER BASIN

FARMINGTON/WEST HARTFORD
CONNECTICUT

SOUTH RESERVOIR DAM

DAM CT 00487

DIKE CT 01709

PHASE 1 INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

Identification No.:	CT 00487 (Dam) CT 01709 (Dike)
Name of Dam:	South Reservoir Dam and Dike
Town:	Farmington/West Hartford
County and State:	Hartford County, Connecticut
Stream:	Tributary to Trout Brook
Date of Inspection:	November 26, 1980

BRIEF ASSESSMENT

This flood control project consists of a dam and dike which are earth embankments at 3H:1V with good grass cover and a top width of 12 feet. The dam is approximately 3060 feet long and 31 feet high. The dike is approximately 475 feet long and 28 feet high. The principal spillway consists of a reinforced concrete riser, a 30 inch RCP through the dam and a reinforced concrete impact basin. The emergency spillway is a 130 foot wide grassed earth channel at the eastern end of the dam. The reservoir is normally empty except for a small sediment pool. These structures are owned by the State of Connecticut, Department of Environmental Protection.

Based on the visual inspection, review of design information, and past operational performance, the dam and dike are judged to be in GOOD condition. There is some erosion due to vehicle trespass and animal burrows were noted in the embankments.

The dam and dike are classified as SMALL in size and HIGH hazard potential structures in accordance with the Recommended Guidelines for Safety Inspection of Dams, by the Corps of Engineers. The impoundment storage at the top of the dam is 900 ac.-ft., the maximum height of the dam is 31 feet and the maximum height of the dike is 28 feet.

Failure of the dam could result in the possible loss of more than a few lives and extensive economic damage to numerous homes and buildings along the downstream channel in West Hartford. The depth of inundation at these homes and buildings would be 0 feet before and 2 to 6 feet after dam failure.

Failure of the dike could result in the possible loss of more than a few lives and extensive economic damage to 3 to 4 homes and buildings along the downstream channel in West Hartford. The depth of inundation at these homes and buildings would be 0 feet before and 2 to 4 feet after dike failure.

The test flood is the Probable Maximum Flood (PMF). The test flood has an inflow equal to 1930 cfs at a stillwater elevation of 291.8 which will not overtop the dam or dike (1.6 feet freeboard). The maximum outflow capacity of the spillways with the water level at the top of the dam is 3580 cfs, which is 185 percent of the test flood outflow.

It is recommended that the following items be studied further by a qualified registered engineer: Investigate the cause and design repairs for the settlement behind the principal spillway outflow impact basin. The reservoir should be visited when floodwaters are being impounded to check for problem areas.

The following remedial measures should be taken by the owner: Recreational vehicle access should be eliminated, vehicle ruts should be repaired, animal burrows should be filled, the semi-annual inspections continued, and the existing flood emergency plan amended to provide downstream warning procedures.

Recommendations and remedial measures that should be implemented within two years of receipt of this Phase I Inspection Report are further described in Section 7.

JAMES P. PURCELL ASSOCIATES, INC.

Sudhir A. Shah

Sudhir A. Shah, P.E.
Director of Engineering
Connecticut P.E. No. 8012

DAM (CT-00487)

This Phase I Inspection Report on SOUTH RESERVOIR DAM,DIKE (CT-01709) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, MEMBER
Geotechmical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation. However, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there by any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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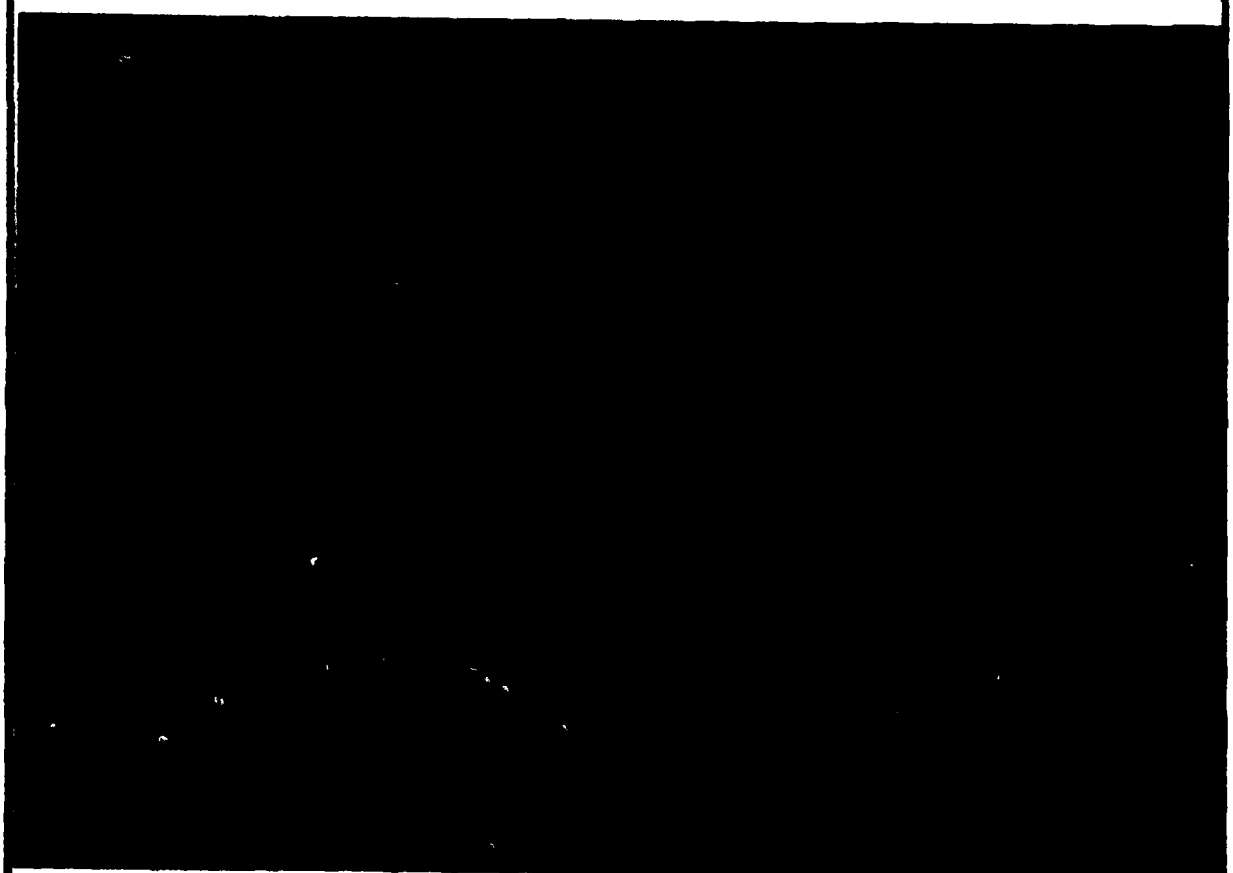
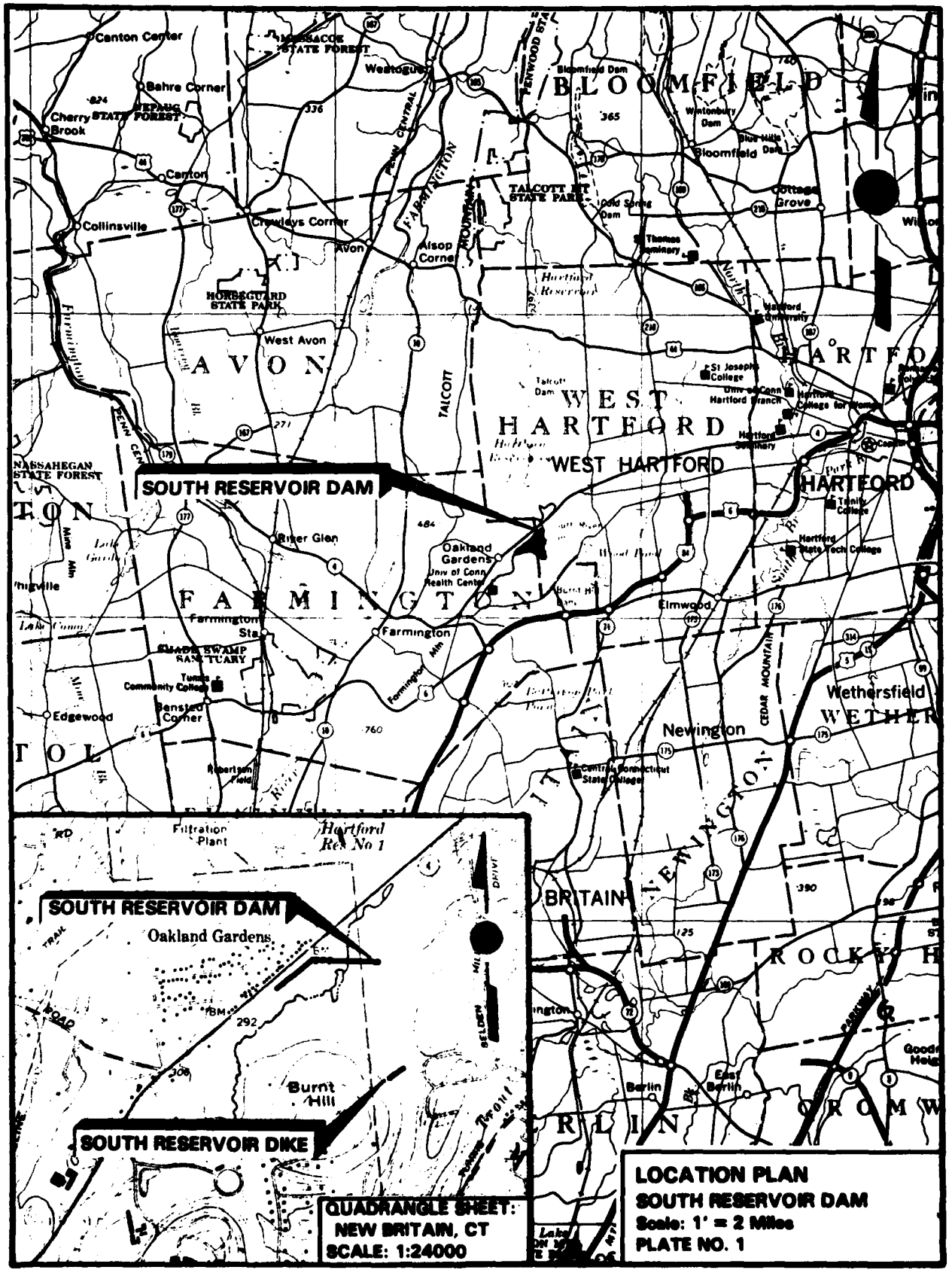
APPENDICES



OVERVIEW PHOTO - SOUTH RESERVOIR DAM

PHOTO TAKEN DECEMBER 15, 1980


SOUTH RESERVOIR DAM
SOUTH RESERVOIR DIKE
Oakland Gardens
Burnt Hill
Filtration Plant
Hartford Res No 1
QUADRANGLE SHEET:
NEW BRITAIN, CT
SCALE: 1:24000
LOCATION PLAN
SOUTH RESERVOIR DAM
Scale: 1" = 2 Miles
PLATE NO. 1

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

NAME OF DAM: SOUTH RESERVOIR DAM (AND DIKE)

SECTION 1

PROJECT INFORMATION

1.1 General

a. Authority:

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army through the Corps of Engineers to initiate a national program of dam inspections throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. James P. Purcell Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to James P. Purcell Associates, Inc., under a letter from William H. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0009 has been assigned by the Corps of Engineers for this work.

b. Purpose:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-federal interests.

2. Encourage and prepare the States to initiate quickly, effective dam safety programs for non-federal dams.

3. To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location:

The South Reservoir structures are located in the Towns of Farmington and West Hartford, Hartford County, Connecticut (See Plate No. 1).

The dam is on the south side of Farmington Avenue approximately 2.5 miles east of the village of Farmington. It is built across a tributary to Trout Brook and is located 6000 feet upstream of the confluence with Trout Brook. The dam is at latitude 41°-44'-37" and longitude 72°-46'-58".

The dike is located across a small valley approximately 2000 feet southeast of the dam. The dike does not cross a watercourse but is designed to contain flood waters within the reservoir. It is located at latitude 41°-44'-19" and longitude 72°-46'-46".

Trout Brook is a tributary to the South Branch of the Park River which flows through Hartford, Connecticut, to the Connecticut River.

All elevations used in this report are based on the Metropolitan District Commission (MDC) Datum, except as noted. The MDC Datum minus 2.08 feet equals the National Geodetic Vertical Datum (NGVD).

b. Description of Dam and Appurtenances:

1. General:

The South Reservoir Project consists of a dam, a small dike, a principal spillway and an emergency spillway.

2. Dam:

The dam is a 3060 foot long earth embankment and is 30.9 feet high at the outlet. It has a top width of 12.0 feet and side slopes of 3H:1V. The grass covered embankment consists of two zones of compacted earth and includes a seepage drain along the downstream toe in the vicinity of the outlet. There is a 12 foot wide cutoff trench at the upstream side of the central core.

3. Outlet Works:

The outlet works consist of a principal spillway and an emergency spillway at the dam. There are no outlet works at the dike. The principal spillway consists of a reinforced concrete riser and a 30 inch reinforced concrete pipe extending from the riser, through the dam to a reinforced concrete impact basin on the downstream face of the dam. The crest of the riser is at elevation 266.0 and is protected by an angle iron trash rack. The small

sediment pool can be drained by removing stop logs in the upstream end of the riser.

4. Emergency Spillway:

The emergency spillway is a grassed earth channel at the eastern end of the dam. The crest of the spillway is a 30 foot long level section at elevation 288.8. The bottom width of the spillway is 130.0 feet, the side slopes are 3H:1V and the length is 1000 feet.

5. Dike:

The dike is also a grass covered two zone compacted earth embankment, 475 feet long and 28.4 feet high, with side slopes of 3H:1V. It has a top width of 12 feet which is at elevation 293.4. There is no seepage drain for this dike. There is a 12 foot wide central cutoff trench.

c. Size Classification:

The size classification of the dam and the dike are SMALL as per the criteria set forth in the Recommended Guidelines for Safety Inspection of Dams, by the Corps of Engineers. The impoundment storage at the top of both structures is 900 ac.-ft. (within the range of 50 to 1000 ac.-ft.). The maximum height of the dam is 30.9 feet and the maximum height of the dike is 28.4 (both within the range of 25 to 40 feet). The size classification of the dam and dike are based on both the impoundment storage and the height criteria.

d. Hazard Classification:

The hazard classification of the dam and of the dike are HIGH as per the criteria set forth in the Recommended Guidelines for Safety Inspections of Dams, by the Corps of Engineers.

In the event of failure of the dam, numerous homes and buildings in an urbanized area of West Hartford could suffer excessive damage. The potential exists for the loss of more than a few lives at downstream homes and buildings which may be inundated by from 2 to 6 feet above ground level. The pre-failure flow of 116 cfs would not inundate any structures. These homes and buildings range from approximately 3 to 6 feet above the normal brook level.

In the event of failure of the dike, 3 to 4 homes immediately downstream could suffer excessive damage. The potential exists for the loss of more than a few

lives at these homes which may be inundated by from 2 to 4 feet above ground level. There would be no pre-failure flow for the dike. These homes range from approximately 3 to 8 feet above the dry channel invert.

e. Ownership:

The South Reservoir Dam and Dike are presently owned and maintained by the State of Connecticut, Department of Environmental Protection.

f. Operator:

The person in charge of maintenance of the structure is:

Mr. Anthony Cantele
Regional Director, Region I
Conservation and Preservation Division
Department of Environmental Protection
P.O. Box 161
Pleasant Valley, CT 06063
Telephone: (203) 379-0771

g. Purpose:

These floodwater retarding structures provide flood protection to the flood plain of the South Branch of the Park River.

h. Design and Construction History:

The design of the dam and dike was completed by the Soil Conservation Service in 1964 and construction was also completed in 1964.

i. Normal Operating Procedure:

There are no day-to-day operational procedures for the dam or dike. The reservoir is normally empty except for a small sediment pool and all flow is discharged through the principal spillway.

1.3 Pertinent Data

a. Drainage Area:

The South Reservoir drainage basin is roughly rectangular in shape with a length of 1.8 miles and an average width of .75 miles resulting in a total drainage area of 1.30 square miles (see drainage basin map in Appendix D). The topography is generally steep terrain with a flatter flood plain. Elevations range

from a high of 530 feet to a low of 266.0 at the principal spillway crest. Stream and basin slopes are flat to steep, 0.8 percent to 13 percent, respectively. The sediment pool has a surface area of 7.1 acres which is approximately 0.9 percent of the watershed.

b. Discharge at Dam Site:

There are no specific discharge records available. Listed below are calculated discharge values for the emergency spillway and outlet works (30 inch principal spillway).

1. Outlet Works: A 30 inch pipe with an invert at elevation 263.0 and a discharge capacity of 116 cfs at elevation 288.8.

2. Maximum known discharge at dam site: Unknown

3. Ungated spillway capacity at top of dam: 3450 cfs at elevation 293.4.

4. Ungated spillway capacity at test flood elevation: 1810 cfs at elevation 291.8.

5. Gated spillway capacity at normal pool elevation: N/A

6. Gated spillway outlet capacity at test flood elevation: N/A

7. Total spillway capacity at test flood elevation: 1810 cfs at elevation 291.8.

8. Total project discharge at top of dam: 3580 cfs at elevation 293.4.

9. Total project discharge at test flood elevation: 1930 cfs at elevation 291.8.

c. Elevation (Feet Above MDC Datum):

1.	Stream bed at toe	262.5 (dam) 265.0 (dike)
2.	Bottom of cutoff	262.0 (dam) 263.0 (dike)
3.	Maximum tailwater	266.0
4.	Normal pool	266.0
5.	Full flood control pool	288.8

6.	Spillway crest	288.8 (emergency spillway)
7.	Design surcharge	291.4
8.	Top of dam and dike	293.4
9.	Test flood level	291.8
d.	**Reservoir (Length in Feet):**	
1.	Normal pool	600
2.	Flood control pool	2200
3.	Spillway crest pool	2200 (emergency spillway)
4.	Top of dam and dike	3000
5.	Test flood pool	2800
e.	**Storage (acre-feet):**	
1.	Normal pool	5.4
2.	Flood control pool	650
3.	Spillway crest pool	650 (emergency spillway)
4.	Top of dam and dike	900
5.	Test flood pool	814
f.	**Reservoir Surface (acres):**	
1.	Normal pool	7.1
2.	Flood control pool	64.1
3.	Spillway crest	64.1 (emergency spillway)
4.	Test flood pool	70.0
5.	Top of dam and dike	71.0
g.	**Dam and Dike:**	
1.	Type	Earth embankments
2.	Length	3060 (dam) 475 (dike)

3.	Height	30.9 (dam) 28.4 (dike)
4.	Top width	12 feet
5.	Side slopes	3H:1V
6.	Zoning	Two zone compacted earth fill
7.	Cutoff	12 foot wide cutoff trenches
8.	Grout curtain	None
9.	Other	- -
h.	**Diversion and Regulating Tunnel:**	**N/A**
i.	**Spillway**	**(emergency spillway)**
1.	Type	grassed channel
2.	Width of channel	130 feet
3.	Crest elevation	288.8
4.	Gates	None
5.	U/S Channel	grassed channel
6.	D/S Channel	grassed channel
7.	General	good condition
j.	**Regulating Outlets:**	**(principal spillway)**

Refer to Paragraph 1.2b - "Description of Dam and Appurtenances" for description of Outlet Works.

1.	Invert	263.0
2.	Size	30 inch
3.	Description	Reinforced Concrete Pipe
4.	Control Mechanism	None
5.	Other	Stop logs on upstream end of riser to drain sediment pool. **Riser Crest Elevation: 266.0**

SECTION 2

ENGINEERING DATA

2.1 Design

The available design data consists of the following documents and plans prepared by the Soil Conservation Service (SCS).

a. "As-built" drawings of construction plans, South Reservoir Dam, 1964. Copies of these plans are included in Appendix B-3.

b. Original design calculations and report.

c. Stage-storage, stage-reservoir area, and stage-discharge curves.

d. Information storage and retrieval form.

Refer to Appendix B-1 for the location of this material.

2.2 Construction

The SCS provided inspection during construction of the structures, which was completed in 1964. The SCS has construction inspection reports in storage. These reports were not reviewed in the preparation of this Phase I Inspection Report.

2.3 Operation

There are no day-to-day operational procedures. The site is visually inspected semi-annually by the State of Connecticut. Inspection records are available from the owner.

2.4 Evaluation

a. Availability:

All information concerning these structures was gathered by field investigation and meetings with the Soil Conservation Service and from the files of the Department of Environmental Protection, Water Resources Unit, Dam Safety Engineers, State Office Building, Hartford, Connecticut.

b. Adequacy:

The information that was available complimented a complete visual inspection of this facility and is adequate at this time.

c. Validity:

The engineering design data provided by the SCS has been deemed adequate for the purpose of this Phase I Inspection Report. The as-built plans appear to adequately represent the present configuration of the structures, based upon the visual inspection. This investigation did not include a detailed engineering check of the SCS design file.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General:

The visual inspection of the South Reservoir Dam and Dike was conducted on November 26, 1980 and a copy of the visual inspection check list is contained in Appendix A of this report.

The following procedure was used:

1. Inspection of the upstream reservoir area which would be impounded by the dam and dike.

2. Visual inspection of the face and top of the dam, dike and spillway for cracks, settlement, seepage, etc.

3. Inspection of the outlet works and other appurtenances as to their existence, location, and operability.

4. Review of procedures that could be utilized in the event of an emergency situation.

5. A check of the downstream area for seepage, piping, boils or other indications of abnormal conditions. The downstream hazard potential in the event of dam or dike failure was investigated.

6. Photographs of the general area of the dam and specific items of note were taken and are included in Appendix C of this report.

Before the inspection, the available existing data was studied and reviewed.

b. Dam:

1. Crest: The dam consists of an earth embankment with no evidence of misalignment or settlement. The top of the dam is 12 feet wide and contains a grassed service road. There are wheel ruts along the top of the dam with bare earth in places (Photos C-5, C-6).

2. Upstream Face: The upstream face consists of a grassed earth slope at 3H:1V (Photos C-2, C-4). Vehicle tracks and animal burrows were noted.

3. Downstream Face: The downstream face consists of a grassed earth slope at 3H:1V (Photos C-2, C-4). The toe, east of the outlet, is damp and vehicle tracks and animal burrows were noted. This dampness is probably due to groundwater. Borings shown on the as-built plans indicate that the groundwater table in this area is approximately at the invert elevation of the outlet conduit.

c. Dike:

1. Crest: The dike consists of an earth embankment with no evidence of misalignment or settlement. The top of the dike is 12 feet wide and there are wheel ruts with bare earth exposed in places (Photo C-15).

2. Upstream face: The upstream face consists of a grassed earth slope at 3H:1V. Vehicle tracks are causing moderate erosion of the slope where the tracks run perpendicular to the dike.

3. Downstream Face: The downstream face consists of a grassed earth slope at 3H:1V. Vehicle tracks are causing moderate erosion of the slope (Photo C-16). A large hole, believed to be an animal burrow, approximately 18 inches in diameter and several feet deep was noted approximately 1/4 of the way from the east abutment. The natural groundwater table appears to be near the surface at the central portion of the downstream toe.

d. Appurtenant Structures:

1. Principal Spillway: The principal spillway consists of a reinforced concrete riser and an uncontrolled 30 inch RCP extending from the riser, through the dam, to an impact basin (Photo C-11) on the downstream face. These concrete structures are in good condition. The riser is protected by an angle iron trash rack (Photo C-9) which is in good condition. Stop logs are presently placed to within 8 inches of the riser crest.

2. Impact Basin: The impact basin consists of a reinforced concrete endwall and baffle (Photo C-11). This concrete structure is in good condition. The seepage drains outlet at the sides of the basin and were partially submerged on November 26, 1980. The drains were flowing (3-5 GPM) on January 26, 1981, when the water level was lower. Settlement is occurring all around the back and sides of the basin (Photos C-12, C-13, C-14). The riprap surrounding the basin is covered with a

concrete slurry. According to the SCS, this was done at the time of construction or shortly thereafter to prevent removal of the riprap by vandals.

3. Emergency Spillway: The emergency spillway is a 130 foot wide grassed channel (Photo C-7). It is approximately 1000 feet long and has side slopes of 3H:1V. The floor of the spillway at the upstream end is marshy with standing water. There is extensive vehicle trespass on the spillway which has resulted in moderate erosion of the embankments (Photo C-8).

e. Reservoir Area:

There is no permanent reservoir except for a small sediment pool. The majority of the area which would be inundated is woodland (Overview Photo). No unusual geological features were noted that could be expected to adversely affect the dam, dike or appurtenant structures.

f. Downstream Channel:

The downstream channel consists of an excavated earth channel which extends approximately 450 feet to an existing stream (Photo C-10). The excavated channel is free of major obstructions.

3.2 Evaluation

Based on visual inspection, the South Reservoir Dam and Dike appear to be in GOOD condition overall and there were no major areas of distress noted. Specific areas of concern that were noted are:

a. The erosion due to vehicle trespass.

b. The animal burrows in the embankments.

c. The settlement around the impact basin.

It should be noted that this floodwater retarding reservoir was not filled at the time of inspection and thus the adequacy of the structure with regard to the functioning of the toe drain filter trench and also with regard to potential seepage problems could not be fully assessed. The reservoir should be visited by a qualified registered engineer when floodwaters are being impounded to check for problem areas. A record of maximum water levels should be kept for reference purposes.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General:

There are presently no formal operational procedures for this facility.

b. Description of Any Warning System in Effect:

There is a formal written "Flood Emergency Plan" in effect for this facility. During a flood "watch", the structures are inspected to insure that the outlets are clear and free of debris. During a flood "warning", State personnel visit the site periodically (2-3 hours) and report on unusual situations. In the event of an emergency situation, the field inspector would call the State Dam Safety Engineer and a decision would be made as to further action to be taken. A copy of the applicable portions of this flood emergency plan is included in Appendix B.

4.2 Maintenance Procedures

a. General:

The grass cover is mowed on an annual basis. Other maintenance such as painting the trash racks and repairing erosion areas is performed on an "as needed" basis based on the findings of the semi-annual inspections.

b. Operating Facilities:

Maintenance of the principal and emergency spillways is as described above in paragraph 4.2a.

4.3 Evaluation

The operational and maintenance procedures are generally satisfactory, but there are areas requiring improvement.

The formal written flood emergency plan should be amended to include downstream warning procedures.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

The South Reservoir Dam will create an impoundment with a total storage capacity of 650 ac.-ft. at elevation 288.8, the emergency spillway crest elevation. Each foot of depth in the reservoir above the emergency spillway crest can accommodate approximately 64 ac.-ft. The emergency spillway is a 130 foot wide grass channel with a crest 4.6 feet below the top of the dam. The drainage area is 1.3 square miles and stream and basin slopes are flat to steep, 0.8 percent to 13 percent, respectively.

5.2 Design Data

a. Original design data (Standard SCS Design Methods) is available for this watershed and the structures of the South Reservoir. To verify existing design information, USGS topographic maps (Scale 1"=2000') were utilized to develop hydrologic parameters such as drainage area, basin length, time of concentration, and other runoff characteristics. Surface area and storage values were verified and taken from the original design data. Some of the pertinent hydraulic design data was confirmed by actual field measurements at the time of the visual inspection.

b. The original design discharge for the facility is 1470 cfs with a corresponding freeboard of 2.0 feet.

c. Outflow values (routing procedures) and dam overtopping analyses were computed in accordance with the guidelines developed by the Corps of Engineers. Judgment was used in calculating final values outlined in this report, which are quite approximate and should not be considered a substitute for actual detailed analysis.

5.3 Experience Data

Historical data for recorded reservoir levels is not available for this dam.

5.4 Test Flood Analysis

Recommended Guidelines for the Safety Inspection of Dams by the Corps of Engineers were used for the selection of the "Test Flood". This facility is classified as a HIGH hazard and SMALL size structure. Guidelines indicate that 1/2 the

Probable Maximum Flood (PMF) to the PMF be used as the "Test Flood" for these classifications. A "Test Flood" equal to the PMF was chosen to yield conservative results in light of the approximate nature of the analysis. The watershed has a total area of 1.3 square miles. Snyder's lag was calculated to be 2.3 hours and a Snyder peaking coefficient of 0.625 was used. The 200 square mile - 24 hour Probable Maximum Precipitation (PMP) is 21.5 inches. The flood hydrograph package, HEC-1 computer program, developed by the Corps of Engineers was utilized to develop the inflow hydrograph, route the flood through the reservoir, and for the dam overtopping analysis. A "Test Flood" inflow equal to the PMF was calculated to be 2750 cfs (2110 csm) and 1/2 the PMF has an inflow value of 1380 cfs (1060 csm).

The emergency spillway capacity is hydraulically adequate to pass the "Test Flood" (PMF) and overtopping of the dam will not occur. The maximum outflow capacity of the project without overtopping the dam is 3580 cfs. This corresponds to 185 percent of the test flood outflow. The maximum outflow discharge value for the "Test Flood" is 1930 cfs corresponding to a depth of flow over the emergency spillway of 3.0 feet and a freeboard of 1.6 feet. A spillway rating curve, outlet rating curve and a stage-storage curve are included in Appendix D of this report.

At the emergency spillway crest elevation of 288.8, the capacity of the 30 inch outlet structure is 116 cfs. It will require approximately 4 days to empty the reservoir assuming a water surface initially at the emergency spillway crest.

The reservoir was assumed to be initially empty for the test flood analysis. It was also assumed that no blockage of the spillways occurred. The affect of tailwater was not considered.

5.5 Dam Failure Analysis

This dam and dike are classified as HIGH hazard structures. Failure discharge could cause damage and the possible loss of more than a few lives due to high velocities, impact from debris, and flooding to numerous residential homes along the downstream channels.

The calculated failure discharges are 53,000 cfs (dam) and 15,600 cfs (dike) at a pool level equal to the emergency spillway crest. The assumed breach lengths are 650 feet (dam) and 80 feet (dike).

The pre-failure flow downstream of the dam would be the principal spillway flow of 116 cfs, corresponding to a

depth of flow of approximately 2 feet. No structures would be inundated by this pre-failure flow. There would be no pre-failure flow for the dike.

The dam failure impact area has been extended 20,000 feet downstream to North Main Street. Numerous homes and buildings in this impact area may be inundated by from 2 to 6 feet above ground level. These homes and buildings range from approximately 3 to 6 feet above the normal brook level. Hartford Reservoir No. 1 may be overtopped by failure of the dam. Additional damage is possible downstream.

The dike failure impact area has been extended 3000 feet downstream to the Burnt Hill Reservoir. Three to four homes in this impact area may be inundated by from 2 to 4 feet of water. These homes range from approximately 3 to 8 feet above the dry channel invert. Additional damage is possible downstream due to overtopping of the Burnt Hill Reservoir.

Water surface elevations due to dam and dike failure are listed in Appendix D on pages D-18 and D-27, respectively.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observation

The visual inspection revealed no signs of major physical distress. The earth embankments, emergency spillway, and dike appear in generally GOOD condition. The tops appear level and embankment and spillway slopes appear stable.

The most significant visual observations with regard to the stability of the structure are the settlement and wetness in the vicinity of the impact basin and moderate erosion gullies on the embankment crest and slopes, emergency spillway floor and abutments, and across the dike slopes and crest.

It should be noted that this floodwater retarding reservoir was not filled at the time of inspection and thus the adequacy of the structure with regard to the functioning of the toe drain filter trench and also with regard to potential seepage problems could not be fully assessed.

6.2 Design and Construction

The design information available consists of the design calculations and report, as-built construction plans, and construction inspection reports. The location of this information is given in Appendix B-1.

6.3 Post-Construction Changes

There have been no post-construction changes to the dam, or appurtenant structures since completion in 1964.

6.4 Seismic Stability

The dam and dike are in Seismic Zone 1 and hence do not require evaluation for seismic stability according to the Corps of Engineers Recommended Guidelines.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition:

Based on the visual inspection, past performance and hydraulic/hydrologic evaluation, the South Reservoir Dam, Dike and appurtenances are judged to be generally in GOOD condition. Items of concern that should be addressed as a result of this inspection are listed in Sections 7.2 and 7.3.

b. Adequacy:

The information available is such that the assessment of the safety of the structures should be based on the visual inspection results, the past operational performance, and the design information that is available.

c. Urgency:

The recommendations and remedial measures described below should be implemented by the owner within two years after receipt of this Phase I Inspection Report.

7.2 Recommendations

It is recommended that the owner engage a qualified registered engineer to carry out the following actions and that his recommendations be implemented.

a. Investigate the cause and design repairs for the settlement behind the impact basin headwall and wingwalls.

b. The reservoir should be visited when floodwaters are being impounded to check for problem areas. A record of maximum water levels should be kept for reference purposes.

7.3 Remedial Measures

a. Operation and Maintenance Procedures:

1. Repair vehicle tracks and large erosion gullies, on the top of the embankments, the dam, the floor and walls of the emergency spillway, and across the dike.

2. During the semi-annual inspections, identify all animal burrows and repair as necessary.

3. Recreational vehicle access to the structures should be eliminated.

4. Continue the semi-annual technical inspection program.

5. The existing formal written flood emergency plan should be amended to include downstream warning procedures.

7.4 Alternatives

There are no practical alternatives to the above stated recommendations.

APPENDIX A

INSPECTION CHECK LIST

INSPECTION CHECK LIST

PARTY ORGANIZATION

PROJECT South Reservoir Dam
- Dam
- Dike

DATE November 26, 1980

TIME 9:30 - 12:00 a.m.

WEATHER Clear

W.S. ELEV. _____ U.S. _____ DN.S.

PARTY:

1. R. Johnston, JPPA
2. J. Hewes, JPPA
3. J. Walsh, Baystate Environmental Consultants, Inc.
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Hydraulics	R. Johnston	
2.	Structural	J. Hewes	
3.	Geotechnical	J. Walsh	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

INSPECTION CHECK LIST

PROJECT South Reservoir Dam DATE November 26, 1980

PROJECT FEATURE Dam NAME

DISCIPLINE NAME

AREA EVALUATED		CONDITION
DAM EMBANKMENT		
Crest Elevation	293.4	Good grass cover, wheel ruts
Current Pool Elevation	265.5	Principal spillway riser crest
Maximum Impoundment to Date		Unknown
Surface Cracks		None observed
Pavement Condition		N/A
Movement or Settlement of Crest		None observed
Lateral Movement		None observed
Vertical Alignment		Good
Horizontal Alignment		Good
Condition at Abutment and at Concrete Structures		Abutments good. Minor erosion at outlet structure
Indications of Movement of Structural Items on Slopes		None observed
Trespassing on Slopes		Yes. Numerous wheel ruts.
Vegetation on Slopes		Good grass cover.
Sloughing or Erosion of Slopes or Abutments		Minor settlement around outlet structure. Numerous animal burrows.
Rock Slope Protection - Riprap Failures		Riprap around outlet structure, covered with concrete slurry.
Unusual Movement or Cracking at or near Toes		None observed
Unusual Embankment or Downstream Seepage		Dampness noted at downstream toe near outlet structure.
Piping or Boils		None observed
Foundation Drainage Features)		Two drains discharging at outlet structure. Partially submerged due to principal spillway discharge.
Toe Drains)		
Instrumentation System		None observed

INSPECTION CHECK LIST

PROJECT South Reservoir Dam — DATE November 26, 1980

PROJECT FEATURE Dike — NAME

DISCIPLINE — NAME

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	
Crest Elevation 293.4	Good grass cover, wheel ruts.
Current Pool Elevation	N/A
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed
Pavement Condition	N/A
Movement or Settlement of Crest	None observed
Lateral Movement	None observed
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Good. No structures on dike.
Indications of Movement of Structural Items on Slopes	N/A
Trespassing on Slopes Vegetation on Slopes Sloughing or Erosion of Slopes or Abutments	Yes. Vehicle paths. Good grass cover. Yes, at vehicle path which runs perpendicular to dike.
Rock Slope Protection - Riprap Failures	None observed
Unusual Movement or Cracking at or near Toes	None observed
Unusual Embankment or Downstream Seepage	None observed
Piping or Boils	None observed
Foundation Drainage Features	None observed
Toe Drains	None observed
Instrumentation System	None observed

INSPECTION CHECK LIST

PROJECT South Reservoir Dam DATE November 26, 1980

PROJECT FEATURE Dam NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Earth channel
Slope Conditions	Good. Grass and cattails
Bottom Conditions	Good
Rock Slides or Falls	None observed
Log Boom	None observed
Debris	None observed
Condition of Concrete Lining	N/A
Drains or Weep Holes	N/A
b. Intake Structure	Concrete riser with angle iron trash rack.
Condition of Concrete	Underwater. Appears good.
Stop Logs and Slots	Stop logs up to 8 inches below riser crest.
Condition of Trash Rack	Good.

INSPECTION CHECK LIST

PROJECT South Reservoir Dam DATE November 26, 1980

PROJECT FEATURE Dam NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION :
OUTLET WORKS - TRANSITION AND CONDUIT	30 inch reinforced concrete pipe.
General Condition of Concrete	Pipe not visible due to structures at intake and outlet. Water was flowing through conduit during inspection.
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

INSPECTION CHECK LIST

PROJECT South Reservoir Dam DATE November 26, 1980

PROJECT FEATURE Dam NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION :
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	Concrete Impact Basin
General Condition of Concrete	Good
Rust or Staining	None observed
Spalling	None observed
Erosion or Cavitation	None observed
Visible Reinforcing	None observed
Any Seepage or Efflorescence	None observed
Condition at Joints	Good
Drain holes	Embankment drains exit at structure.
Channel	Excavated channel extends approx. 450 ft. through woods. Trees in woods beyond excavated channel.
Loose Rock or Trees Overhanging Channel	
Condition of Discharge Channel	Good
	Note: Concrete slurry was poured over riprap surrounding outlet structure.
	Note: Minor erosion and depression in embankment all around impact basin.

INSPECTION CHECK LIST

PROJECT South Reservoir Dam DATE November 26, 1980

PROJECT FEATURE Dam NAME

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	Earth Emergency Spillway
a. Approach Channel	Grassed Channel
General Condition	Good. Wheel ruts in places.
Loose Rock Overhanging Channel	None observed
Trees Overhanging Channel	None observed
Floor of Approach Channel	Grassed. Standing water in places.
b. Weir	
General Condition of Concrete	
Rust or Staining	Note: Weir is a 30 foot long grassed level section between approach and discharge channels.
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	
c. Discharge Channel	Grassed channel.
General Condition	Good. Wheel ruts in places.
Loose Rock Overhanging Channel	None observed
Trees Overhanging Channel	None observed
Floor of Channel	Grassed. Damp in places.
Other Obstructions	Woods at end of channel.
	NOTE: Numerous erosion areas are caused by vehicle trespass. Two animal holes were noted in the west spillway embankment.

APPENDIX B

ENGINEERING DATA

APPENDIX B-1

DESIGN, CONSTRUCTION AND MAINTENANCE RECORDS

Location		Items
Mr. Victor J. Galgowski Dam Safety Engineer Water Resources Unit Department of Environmental Protection State of Connecticut State Office Building Hartford, Connecticut 06115	•	1. As Built Plans
		2. State Inspection Reports
	•	3. Rating Curves
	•	4. Flood Emergency Plan
Mr. Whitney T. Ferguson, Jr. State Conservation Engineer Soil Conservation Service U.S. Department of Agriculture Mansfield Professional Park Storrs, Connecticut 06268		1. As Built Plans
	•	2. Design Report
		3. Design Calculations
		4. Construction Inspection Reports
	•	5. Information Storage and Retrieval Form

• Indicates material contained in this Phase I Inspection Report.

DESIGN REPORT

SOUTH BRANCH-PARK RIVER WATERSHED
SOUTH RESERVOIR - SITE NO. 3
HARTFORD COUNTY, CONNECTICUT

This floodwater retarding dam is located in West Hartford, Connecticut on an unnamed tributary of Trout Brook. The transparent overlay on sheet 4 of this report used in conjunction with the New Britain, Connecticut quadrangle published by the U.S. Geological Survey will locate this structure.

This dam has a class (c) hazard classification, and is designed in accordance with the criteria established by the Soil Conservation Service.

It is one of four structures which will provide flood protection for the South Branch of the Park River flood plain. It will temporarily impound floodwaters comparable to those experienced during hurricanes Carol and Diane (1955) without the discharge through emergency spillway.

The dam and the dike upstream from it, which controls flood impoundment, will be built of compacted earthfill on a pervious foundation. The dam will have a drainage system under the downstream portion of the embankment to control the effects of seepage.

The principal spillway conduit will consist of specially designed 30-inch inside diameter reinforced concrete water pipe automatically controlled by a reinforced concrete entrance structure. This riser will be equipped with wooden flashboards to permit water level control or drainage of the small existing pond which will be improved by the sponsors. The conduit will discharge through an impact type of energy dissipator into the constructed outfall channel. The emergency spillway will be excavated through fine grained sands in the east abutment of the dam. Its bottom and side slopes, as well as the slopes of the earth embankments, will be protected by erosion resistant vegetative cover.

There is a possibility that in the future a major highway will be constructed across a portion of the floodwater storage reservoir as shown on sheet 3 of the plans. The hydrologic calculations considered and provided for this possible loss of floodwater storage.

The results of hydrologic and hydraulic determinations are given in the following table:

REFERENCE:	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ENGINEERING & WATERSHED PLANNING UNIT UPPER DARBY, PENNSYLVANIA	DRAWING NO. CH-420-R SHEET 1 OF 4 DATE 10/3/63

DESIGN REPORT

Factor Which Determines Stage	Surface Area Acres	Runoff Area Acres	Peak Inflow c.f.s.	Peak Outflow c.f.s.	Elev. of Maximum Stage	Storage in Ac.-Ft.	Element of Structure Determined by Maximum Stage
50-year sediment acc.	7.1	-	-	-	266.0	5.4	Crest of riser
Work plan	64.1	9.92	585	119	288.8	650	Crest of emergency spillway
Routing 1.75x6-hr. pt. rainfall moisture condition III	68.0	15.9	6860	1500	291.4	805	Design high water
Routing 2.5x6-hr. pt. rainfall moisture condition II	71.0	20.8	8900	3000	293.4	900	Top of dam

Time to empty 100 percent of flood storage is 3.77 days.

Copies of the geology and soil mechanics laboratory reports used in the design of this structure are made a part of this design report.

The following publications were used also in the design of this structure:

NEH No. 5, Hydraulics
NEH No. 4, Hydrology
NEH No. 6, Structural Design
Engineering Division Technical Releases Nos. 2 and 3

REFERENCE:

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ENGINEERING & WATERSHED PLANNING UNIT
UPPER DARBY, PENNSYLVANIA

DRAWING NO. CH-420-R
SHEET 2 OF 4
DATE 10/3/63

DESIGN REPORT

Copies of these publications may be obtained from Mr. N. Paul Tedrow, State Conservationist, Soil Conservation Service, Storrs, Connecticut.

Gerald E. Oman
Design Engineer

T. R. Wire
State Conservation Engineer

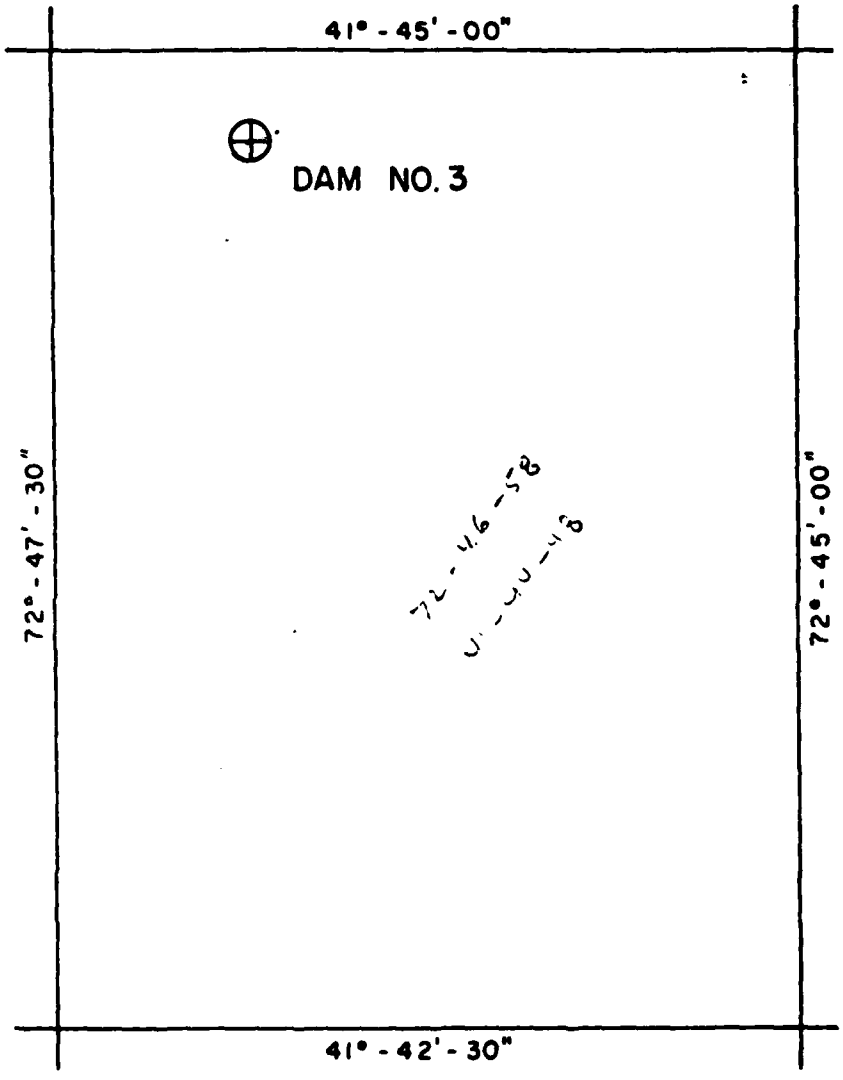
Concurred:

Vincent McKeever
Hydrologist

Robert F. Fonner
Geologist

REFERENCE:	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ENGINEERING & WATERSHED PLANNING UNIT UPPER DARBY, PENNSYLVANIA	DRAWING NO. CW-420-R SHEET 3 OF 4 DATE 10/3/63

DESIGN REPORT



REFERENCE:	U.S. DEPARTMENT OF AGRICULTURE	DRAWING NO.
NEW BRITAIN CONN.	SOIL CONSERVATION SERVICE	CN-420-R
7.5' QUADRANGLE	ENGINEERING & WATERSHED PLANNING UNIT	SHEET 4 OF 4
	UPPER DARBY, PENNSYLVANIA	DATE

6-13-75 [illegible] CONSTRUCTED BY SCS

SITE ID NO.

IDENTIFICATION AND LOCATION

1. Site 3 South Reservoir — STRUCTURE DESIGNATION (NAME OR NUMBER)
2. Park River-Conn. River — RIVER BASIN (NAME)
3. South Branch-Park River — WATERSHED (NAME OR UNNAMED)
4. Connecticut — STATE (NAME)
5. Hartford — COUNTY (NAME)
6. West Hartford — TOWNSHIP (NAME)
7. 1 — CONGRESSIONAL DISTRICT (NUMBER)
8. Central Connecticut Lowlands — PHYSIOGRAPHIC AREA 1/ (NAME)
9. WP — AUTHORIZATION (SP, FP, RC&D, CO-OP, PILOT)
10. 72 46 58 — LATITUDE (DEGREES, MINUTES, SECONDS)
11. 41 44 48 — LONGITUDE (DEGREES, MINUTES, SECONDS)
12. 294.2 — ELEVATION OF TOP OF DAM (SETTLED FILL-FEET MSL)
13. DATE PLAN APPROVED 1962
14. DATE OF MOST RECENT SUPPLEMENT 1972 (LEAVE BLANK IF NOT SUPPLEMENTED)
15. DATE CONSTRUCTION COMPLETED 1964 (LEAVE BLANK IF NOT COMPLETED)
16. TYPE OF DAM (CIRCLE APPLICABLE) - (EARTH), ROCK, CONCRETE, OTHER
17. PLANNED PURPOSES (CIRCLE ALL APPLICABLE) - (FLOOD PREVENTION), RECREATION, FISH & WILDLIFE, MUNICIPAL AND INDUSTRIAL WATER SUPPLY, IRRIGATION, NAVIGATION, HYDRO-ELECTRIC, SEDIMENT CONTROL, LOW FLOW AUGMENTATION, OTHER
18. HAZARD CLASS (A, B, OR C) C
19. EARTHQUAKE ZONE 2/ (0, 1, 2, 3, or 4) 1

SIZE AND CAPACITY

20. DRAINAGE AREA UNCONTROLLED 830 AC. (UPSTREAM FROM STRUCTURE)
21. DRAINAGE AREA CONTROLLED ____ AC. (UPSTREAM FROM STRUCTURE)
22. MAXIMUM FILL HEIGHT 31 FT. (FROM LOW POINT ON CENTERLINE, BEFORE EXCAVATING TO TOP OF SETTLED FILL.)
23. CREST LENGTH OF DAM ALONG CENTERLINE Dam 3,060 FT.
24. VOLUME OF FILL 108,800 CU. YD. Dike 475

25. SUBMERGED SEDIMENT STORAGE 5.4 AC. FT.
26. AERATED SEDIMENT STORAGE ____ AC. FT.
27. MUNICIPAL AND INDUSTRIAL WATER STORAGE ____ AC. FT.
28. RECREATION WATER STORAGE ____ AC. FT.
29. FISH AND WILDLIFE STORAGE ____ AC. FT.
30. IRRIGATION STORAGE ____ AC. FT.
31. OTHER BENEFICIAL STORAGE ____ AC. FT.
32. TOTAL FLOOD STORAGE 650 AC. FT.
33. TEMPORARY EMERGENCY SPILLWAY STORAGE (BETWEEN CREST OF LOWEST EMERGENCY SPILLWAY AND TOP OF SETTLED FILL) 250 AC. FT.
34. SURFACE AREA OF NORMAL POOL ____ AC.
35. LENGTH OF SHORE LINE OF NORMAL POOL ____ MILES
36. MAXIMUM DEPTH OF NORMAL POOL ____ FT.

PRINCIPAL SPILLWAY FEATURES

37. PRINCIPAL SPILLWAY TYPE (CIRCLE APPLICABLE) - (PIPE), MONOLITHIC, OPEN CONCRETE STRUCTURE, OTHER
38. IS THERE COLD WATER RELEASE FACILITY? No
39. NUMBER OF STAGES 1 (1 or 2)
40. LOW STAGE CAPACITY ____ CFS (AT HIGH STAGE PRINCIPAL SPILLWAY CREST)
41. PRINCIPAL SPILLWAY CAPACITY 119 CFS (AT LOWEST EMERGENCY SPILLWAY CREST)

PRINCIPAL SPILLWAY CONDUIT FEATURES

42. MAJOR PORTION OF CONDUIT IS ON (CIRCLE APPLICABLE) - ROCK OR (EARTH)
43. TYPE OF ENERGY DISSIPATOR (CIRCLE APPLICABLE) - (IMPACT BASIN), SAF, PLUNGE POOL, NONE, OTHER
44. CONDUIT SIZE 2.5 (LARGEST CONDUIT THROUGH DAM) (DIAM. IN FT. IF ROUND) (HEIGHT AND WIDTH IN FT. IF MONOLITHIC) ALSO SHOW NUMBER OF BARRELS IF MULTI-BARREL
45. INLET TYPE (CIRCLE APPLICABLE) - (CONCRETE-OPEN TOP), COVERED TOP, HOOD INLET, METAL-OPEN TOP, OTHER
46. HEIGHT OF RISER 3.0 FT. (FROM TOP OF FLOOR TO TOP OF ANTI-VORTEX)

EMERGENCY SPILLWAY FEATURES

47. PRIMARY EMERGENCY SPILLWAY TYPE (CIRCLE APPLICABLE) CLOSED CONDUIT, OPEN CONCRETE STRUCTURE, EARTH, (VEGETATED) SOFT ROCK, HARD ROCK 3/
48. PRIMARY EMERGENCY SPILLWAY WIDTH 130 FT. (CREST LENGTH FOR CONCRETE)
49. 1 % PERCENT CHANGE IN USE OF PRIMARY EMERGENCY SPILLWAY

1/ N. M. Fenneman, 1938, Physiography of Eastern United States, McGraw Hill Book Co., New York, N. Y.

2/ See TSC Technical Note - Engineering UD-22.

3/ Soft Rock - Rock that will erode when subjected to flowing water.
Hard Rock - Rock that is resistant to erosion due to flowing water.

CONTINUED ON REVERSE SIDE

50. 2881 CFS
CAPACITY OF PRIMARY EMERGENCY SPILLWAY (WHEN POOL IS AT TOP OF DAM)

51. 4.6 FT.
DIFFERENCE IN ELEVATION BETWEEN CREST OF PRIMARY EMERGENCY SPILLWAY AND TOP OF DAM

52. SECONDARY EMERGENCY SPILLWAY IS (CIRCLE APPLICABLE)
NONE, EARTH, VEGETATED, SOFT ROCK, HARD ROCK 3/

53. WIDTH OF SECONDARY EMERGENCY SPILLWAY ___ FT.

54. CAPACITY OF SECONDARY EMERGENCY SPILLWAY (WHEN POOL IS AT TOP OF DAM) ___ CFS

55. ___ FT.
DIFFERENCE IN ELEVATION BETWEEN CREST OF SECONDARY EMERGENCY SPILLWAY AND TOP OF DAM

OMIT ITEMS 56-59 IF DRAINAGE AREA IS LESS THAN 10 SQUARE MILES

56. BULK LENGTH OF SOFT ROCK 3/ EARTH OR VEGETATED SPILLWAY (SEE TR-52 FOR DEFINITION) ___ FT.

57. ___
PI OF SURFACE MATERIAL IN EARTH OR VEGETATED SPILLWAY (PREDOMINANT MATERIAL AT OR NEAR SURFACE BEFORE TOP SOILING)

58. ___
USCS CLASSIFICATION OF ABOVE MATERIAL

59. ___ AC. FT.
VOLUME OF OUTFLOW THROUGH VEGETATED OR EARTH SPILLWAY (DURING PASSAGE OF FREEBOARD HYDROGRAPH)

COST DATA

WORK PLAN

60. LAND RIGHTS COST $ 45,133

61. FEDERAL SHARE OF LAND RIGHTS COST $ ___

62. CONSTRUCTION COST $ 126,455
(DOES NOT INCLUDE LAND RIGHTS, ENGINEERING AND PROJECT ADMINISTRATION)

63. FEDERAL SHARE OF CONSTRUCTION COST IN PERCENT 100 %

COMPLETED STRUCTURE

64. FINAL CONSTRUCTION COST $ 118,900

MISCELLANEOUS DATA

65. South Reservoir
POPULAR NAME OF DAM

66. ___
NAME OF RESERVOIR

67. NEAREST CITY OR TOWN West Hartford

68. TYPE OF DAM IF CONCRETE (CIRCLE APPLICABLE)
BUTTRESS, ARCH, MULTI-ARCH

69. IS DISCHARGE THROUGH PRINCIPAL SPILLWAY CONTROLLED BY GATES? No

70. ESTIMATED COMPLETION DATE (IF UNDER CONSTRUCTION) ___

71. OWNER State of Connecticut

72. ENGINEERING BY Soil Conservation Service

73. CONSTRUCTION BY Mark Construction Co.
(CONSTRUCTION CONTRACTOR)

74. ABOVE DATA FURNISHED BY Joseph Polulech
(NAME)

75. DATE DATA FURNISHED 11/75

76. REMARKS ___

3/ Soft Rock - Rock that will erode when subjected to flowing water.
Hard Rock - Rock that is resistant to erosion due to flowing water.

will commence. The pump and hoses are stored in Building No. 17.

d. All gates will be inspected to insure proper closing without clogging by debris.

e. Screen well house openings will be closed. The closure will consist of

(i) stoplogging the one entrance door into the structure,

(ii) closing the maintenance trough opening with the steel plate mounted outside the building, and

(iii) the sluice gate on the opening under the well house floor will be secured.

The flood works are on the property of Chase Brass and Cooper Co., Inc., and AMTRAK. Chase Brass has agreed to assist in maintaining and operating these works. The individuals assigned to these responsibilities from Chase Brass are as follows:

L. Conard	756-9448
B. Kleinselbeck	754-8229

(A guard is on duty 24 hours at the plant.)

5. Soil Conservation Service Flood Control Structures: The dams listed below are dry flood control dams which are owned and operated by the State of Connecticut. Their sole purpose is to impound and slowly release flood water. In order to properly operate, it is imperative the culverts be clear and free of debris. For this reason, upon notification of a watch the structures should be inspected to insure clear outlets. During a warning the dams will be inspected at approximately 2 - 3 hour intervals. Inspections should consist of

a. estimating the height of water,

b. looking for piping failures, sand boils, or other abnormal leakage, especially in the vicinity of the culvert outlets, and

c. looking for the development of slope sloughing or other structural problems.

Findings of each inspection should be reported immediately to the F.E.O.C.

FLOOD EMERGENCY PLAN PP 7
CONN. DEPT. ENVIR PROT.

Crew Assignments:

Bloomfield Reservoir, Site 3, Tunxis Ave. Bloomfield

Bloomfield Reservoir, Site 3a, Tunxis Ave., Bloomfield

Blue Hills Reservoir, Filley Street, Bloomfield

Wintonbury Reservoir, Filley Street, Bloomfield

Coldspring Reservoir, Simsbury Road, Bloomfield

Crew:	Home	Office
Marilyn Aarrestad	658-5593	242-1158
Thomas Noonan	247-1847	242-1158
Calvin Innes	653-2996	242-1158

Thousand Acre Swamp, New Marlboro, Massachusetts

Westside Reservoir, Westside Raod, Norfolk

Norfolk Reservoir, Route 44, Norfolk

Wood Creek Reservoir, Route 272, Norfolk

Whiting River Reservoir, Canaan Valley Road, North Canaan

Crew:

Stanley Civco	542-5423	SAME

Roaring Brook, Unionville

▷ South Reservoir, Farmington Avenue, West Hartford

Burnt Hill Reservoir, Tunxis Road, West Hartford

Bugbee Reservoir, Hickory Lane, West Hartford

Talcott Reservoir, Route 44, West Hartford

Crew:

Robert Corbidge	673-3955	677-1819
Phillip Johnson	673-2943	677-1819
Ransom Watson	677-1819	677-1819

6. Highland Lake Flood Control Works: As part of the Flood works for Winsted, the dam at the north end of Highland Lake can be sandbagged -> prior to flooding to increase the storage capacity

WHITNEY TO TAKE CHARGE

APPENDIX B-2

COPIES OF PAST INSPECTION REPORTS

No. _____ WATER RESOURCES COMMISSION
SUPERVISION OF DAMS
INVENTORY DATA

11

CT 487

Inventoried By JT

Date 6/15/73

Name of Dam or Pond South ~~Dam~~ Res

Code No. F. 11

Nearest Street Location Rt. 4

Town Farmington

U.S.G.S. Quad. New Britain

Name of Stream _____

Owner Unknown DEP

Address _____

LAT 41°44.6'

LONG. 72°46.9'

Pond Used For flood control DA 1.24 SM

Dimensions of Pond: Width _____ Length _____ Area 64

1966

Total Length of Dam 2000' Length of Spillway _____

Location of Spillway EAST END

Height of Pond Above Stream Bed 26.4'

Height of Embankment Above Spillway 4.6'

Type of Spillway Construction RISER & RCP

Type of Dike Construction EARTH

Downstream Conditions _____

Summary of File Data _____

Remarks D. AREA 832A

Would Failure Cause Damage? B-11 Class _____

APPENDIX B-3

RECORD DRAWINGS AND SKETCHES

SOUTH BRANCH PARK RIVER WATERSHED PR

FLOODWATER RETARDING DAM NO. 3
SOUTH RESERVOIR

DRAINAGE AREA	832	ACRES
FLOOD STORAGE TO EMERGENCY SPILLWAY CREST	650	ACRE FT.
WATER SURFACE AREA @ EMERGENCY SPILLWAY CREST	64	ACRES
HEIGHT OF DAM	31	FEET
VOLUME OF FILL	108,800	CUBIC YARDS

BUILT UNDER THE WATERSHED PROTECTION AND FLOOD PREVENTION ACT

BY

COMMISSIONER OF AGRICULTURE AND NATURAL RESOURCES
STATE OF CONNECTICUT

WITH THE ASSISTANCE OF THE

SOIL CONSERVATION SERVICE

OF THE

UNITED STATES DEPARTMENT OF AGRICULTURE

1964

SHEET 1 - COVER SHEET

SHEET 2 - PLAN OF STORAGE AND BORROW AREAS

ERSHED PROJECT

M NO. 3

ACRES
ACRE FT.

ACRES

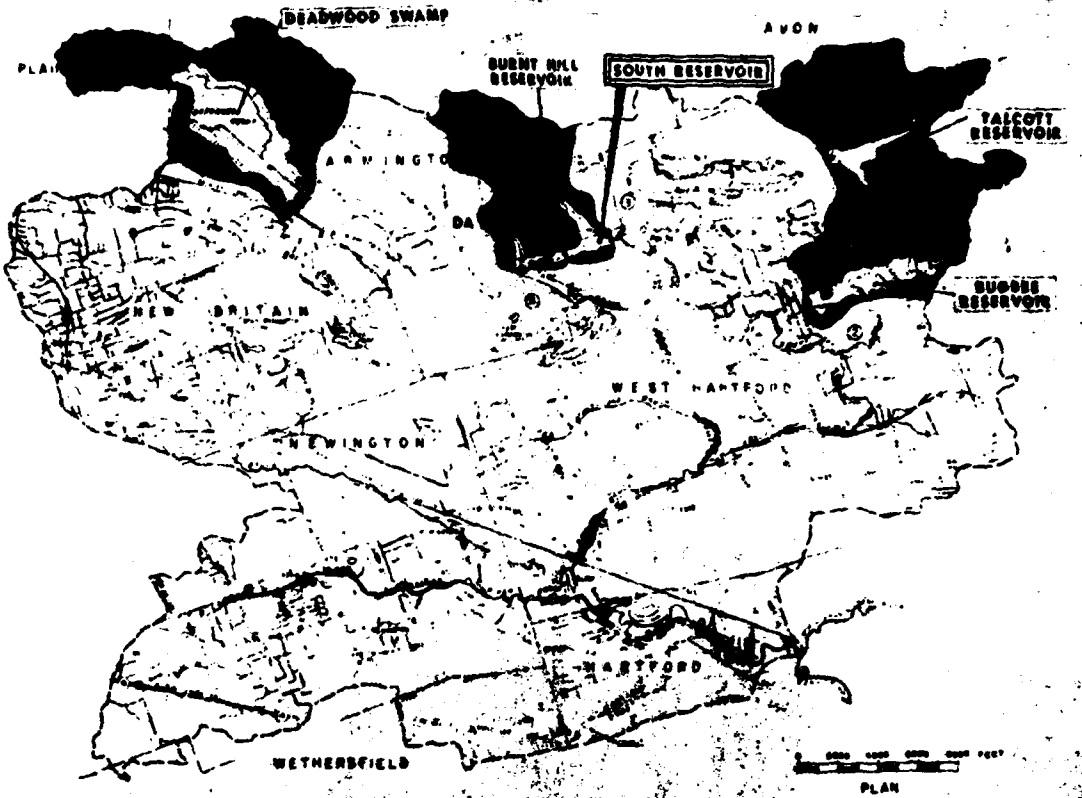
FEET
CUBIC YARDS

TECTION AND
T

RAL RESOURCES

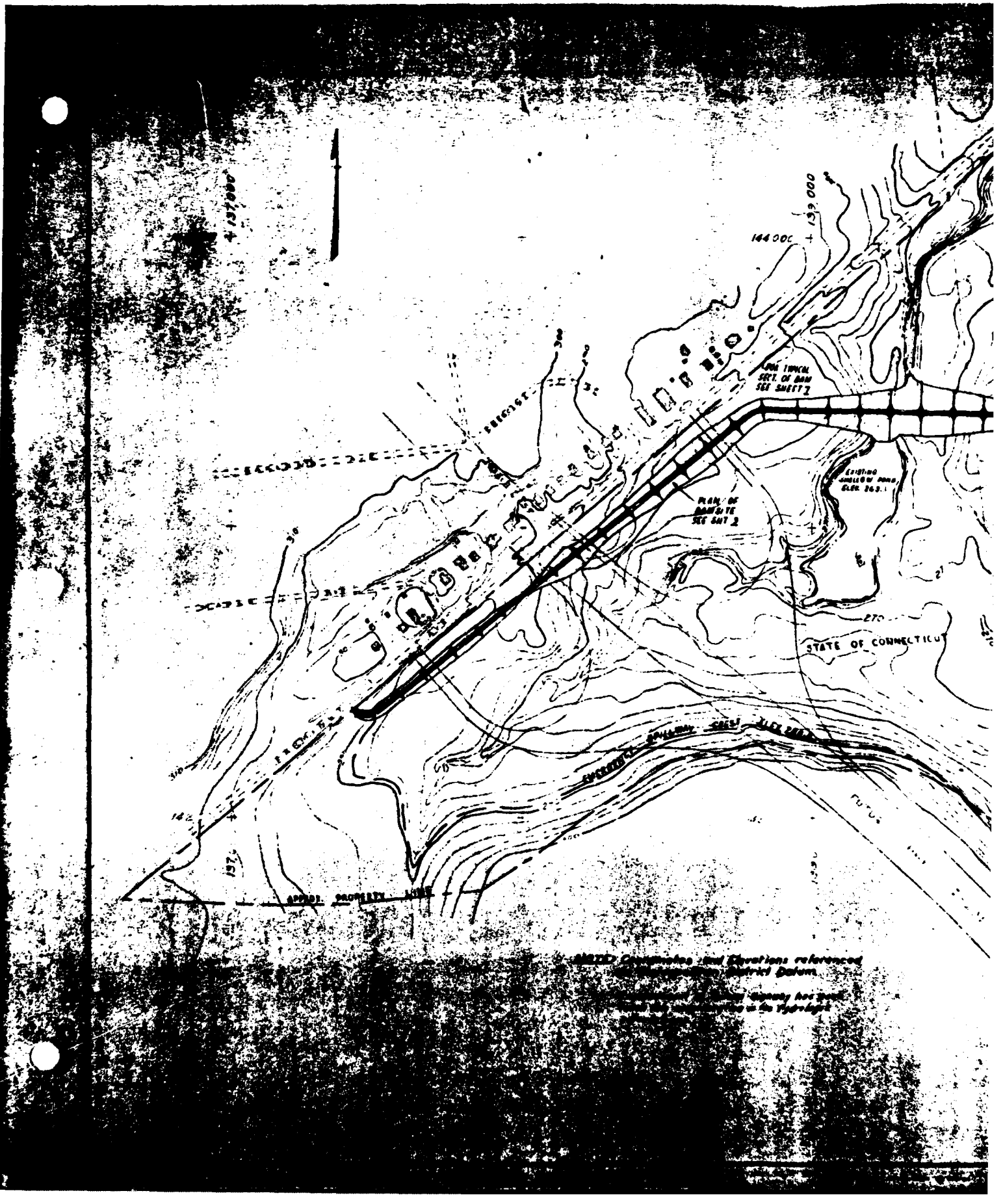
E

ICULTURE

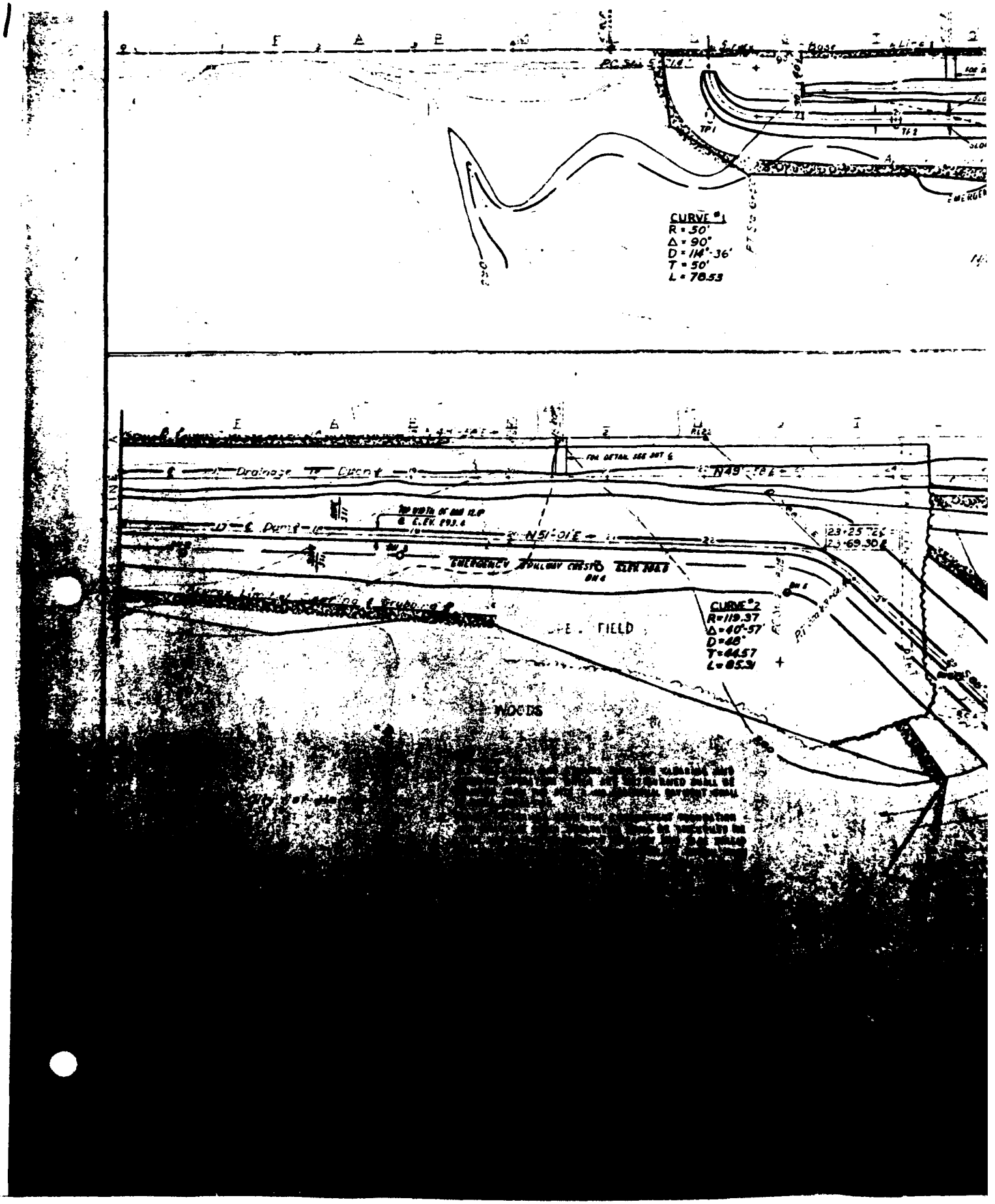


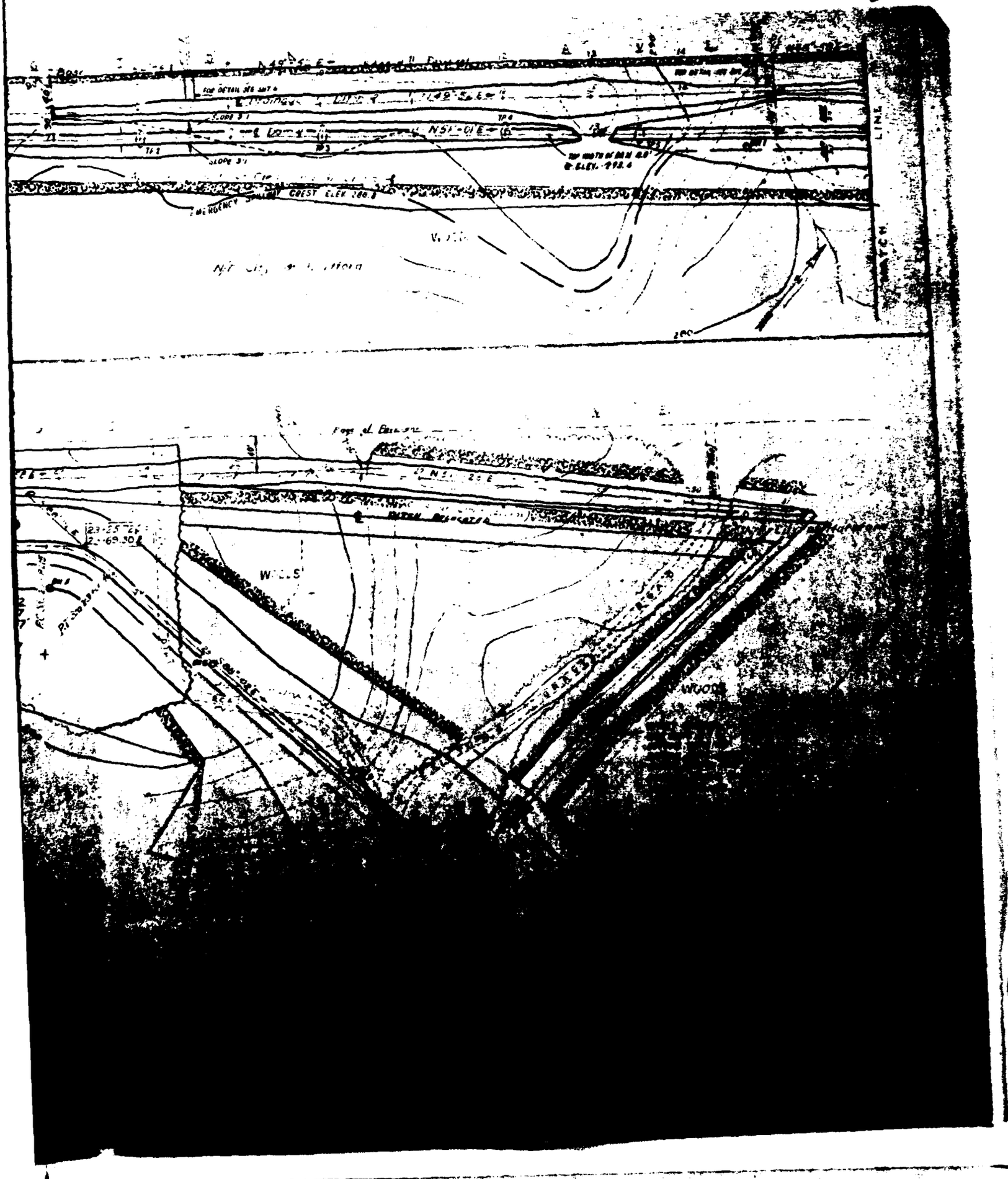
AREAS

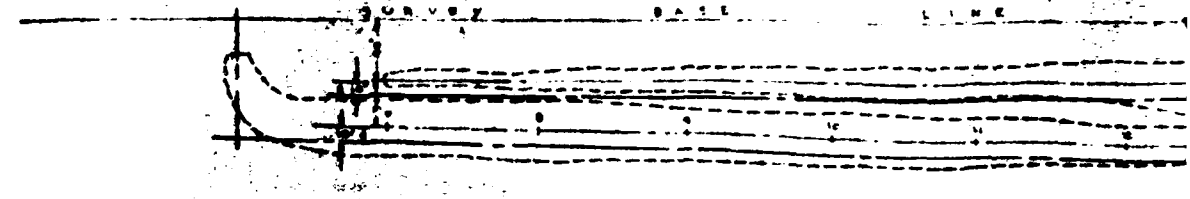
ND DIKE
ILLWAY
SPILLWAY

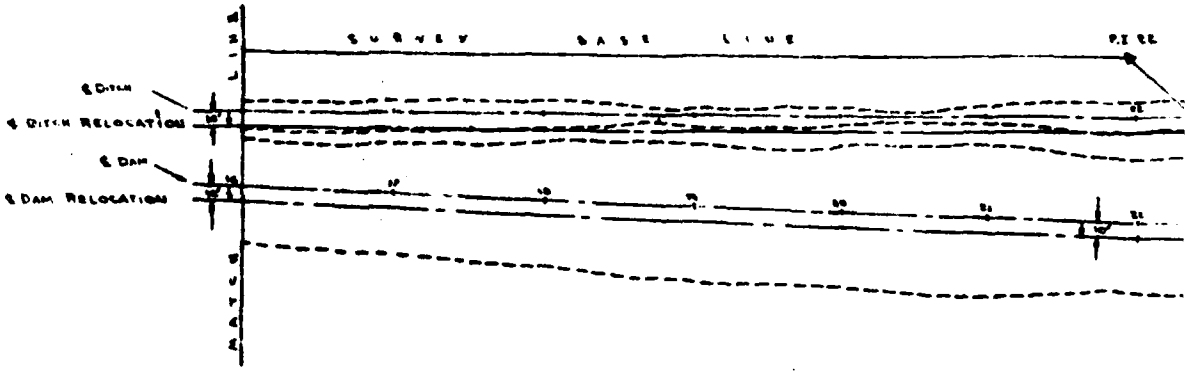

144000
139000
LINE TYPICAL SECT. OF DAM SEE SHEET 2
PLAN OF BORROW SITE SEE SHT 2
STATE OF CONNECTICUT
APPROX. PROPERTY LINE


144,000
139,000
STATE OF CONNECTICUT
CITY OF HARTFORD
SCALE
SOUTH RESERVOIR
WEST HARTFORD, CONN.
PLAN OF STORAGE AND BORROW AREAS
U.S. DEPARTMENT OF AGRICULTURE


CURVE #1
R = 50'
Δ = 90°
D = 114°-36'
T = 50'
L = 78.53
CURVE #2
R=119.37
Δ=40°-57'
D=48°
T=44.57
L=85.21
N49°-28'E
N51°-01'E
WOODS


CREST ELEV. 288.0
SLOPE 3:1
WELLS
WOODS

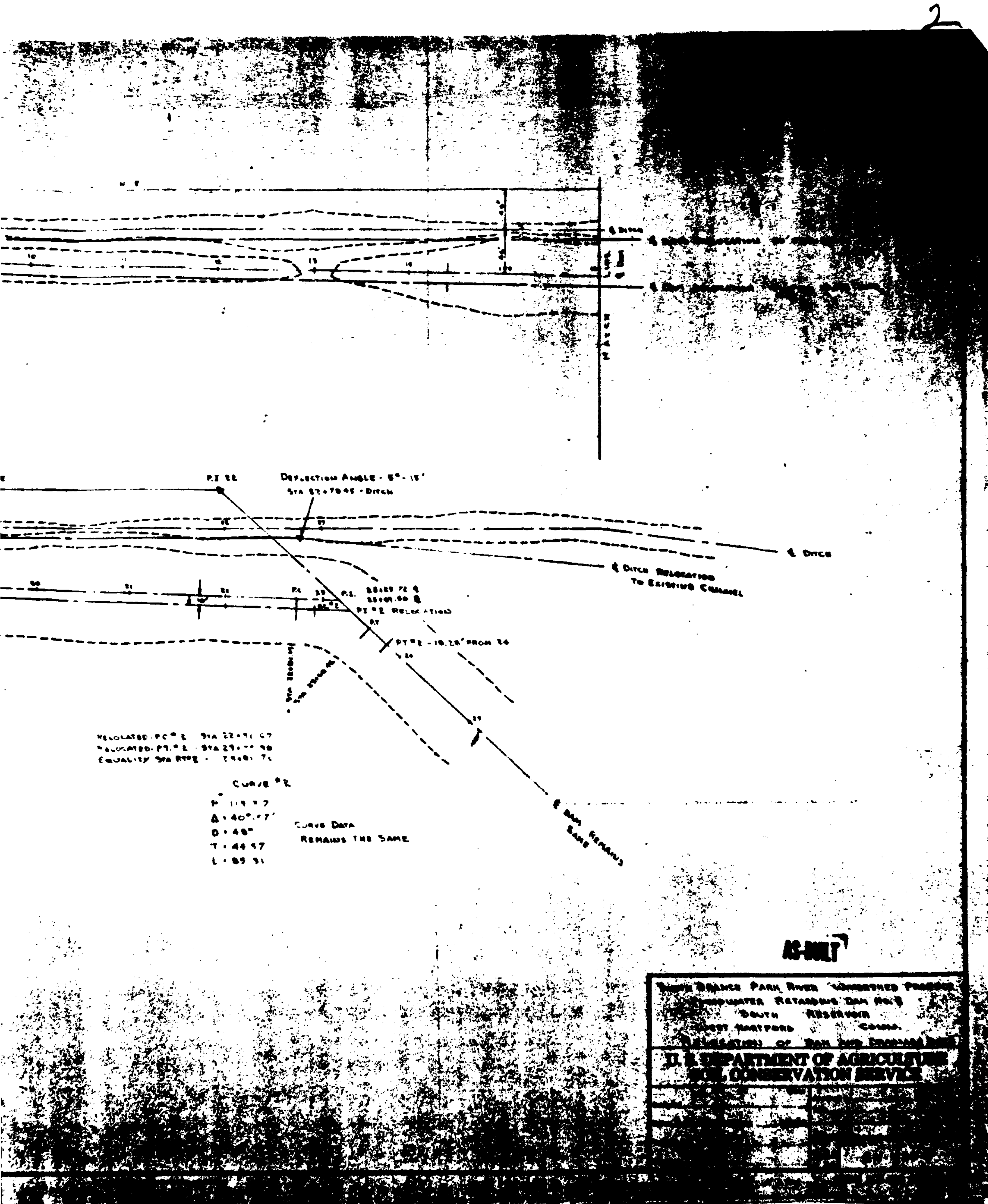




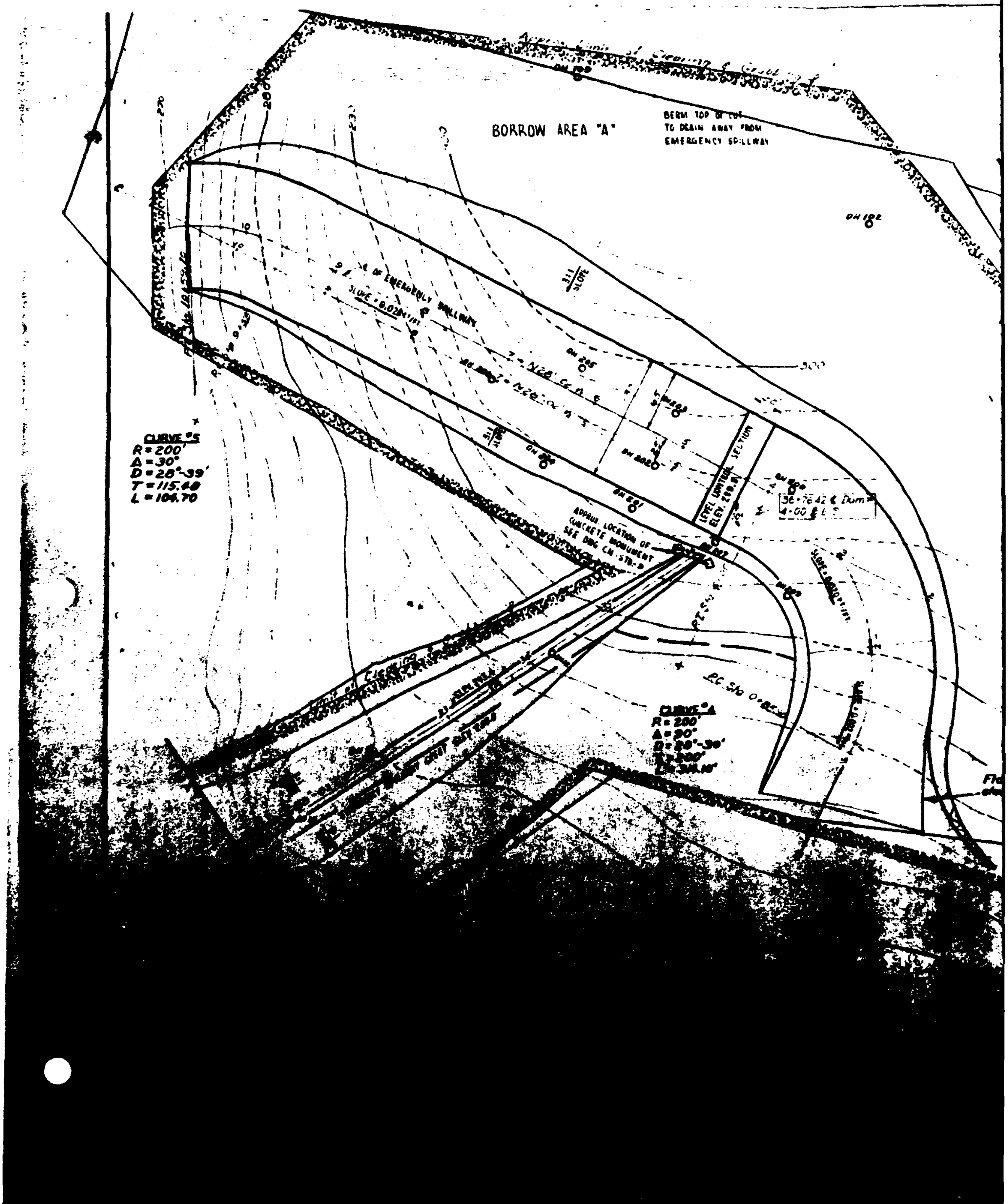
DAM AND DRAINAGE DITCH
RELOCATED 10 ADDITIONAL FEET FROM
SURVEY BASE LINE

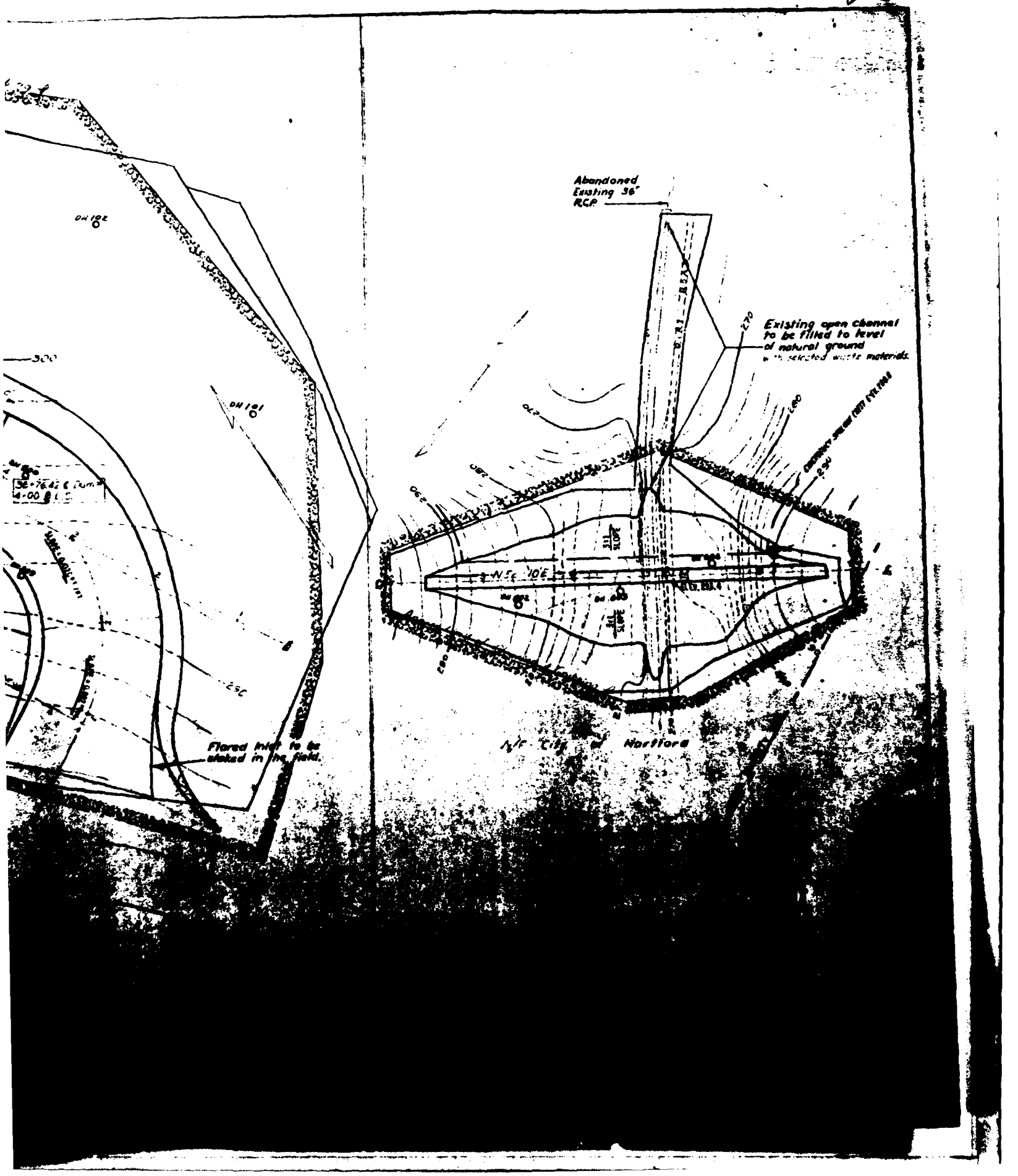
RELOCATED-P.C.℄ Sta 22+
RELOCATED-P.T.℄ Sta 23+
EQUALITY Sta P.I.℄ 23+

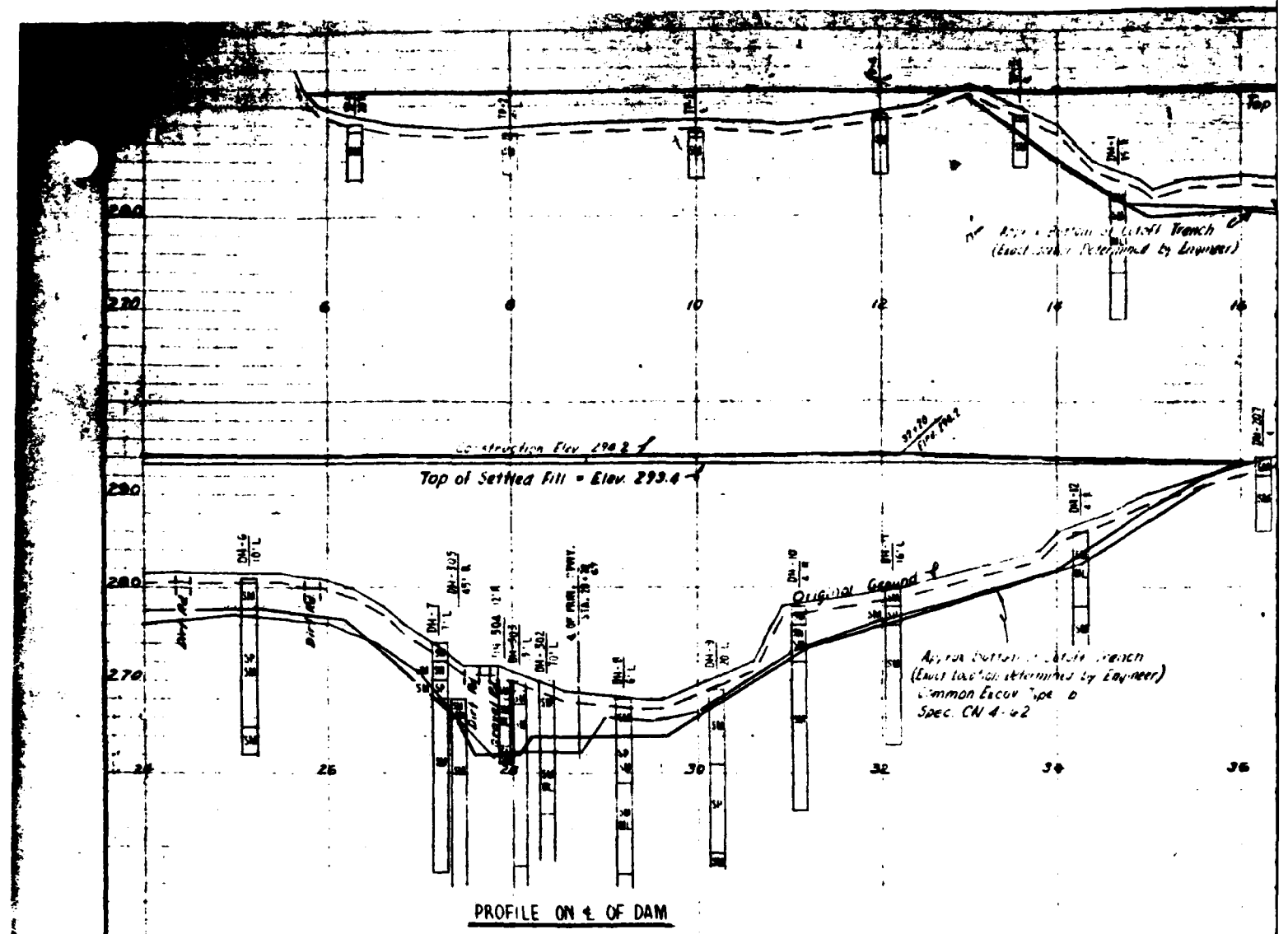
CUR
P 119
Δ 40°
D 48°
T 44
L 85



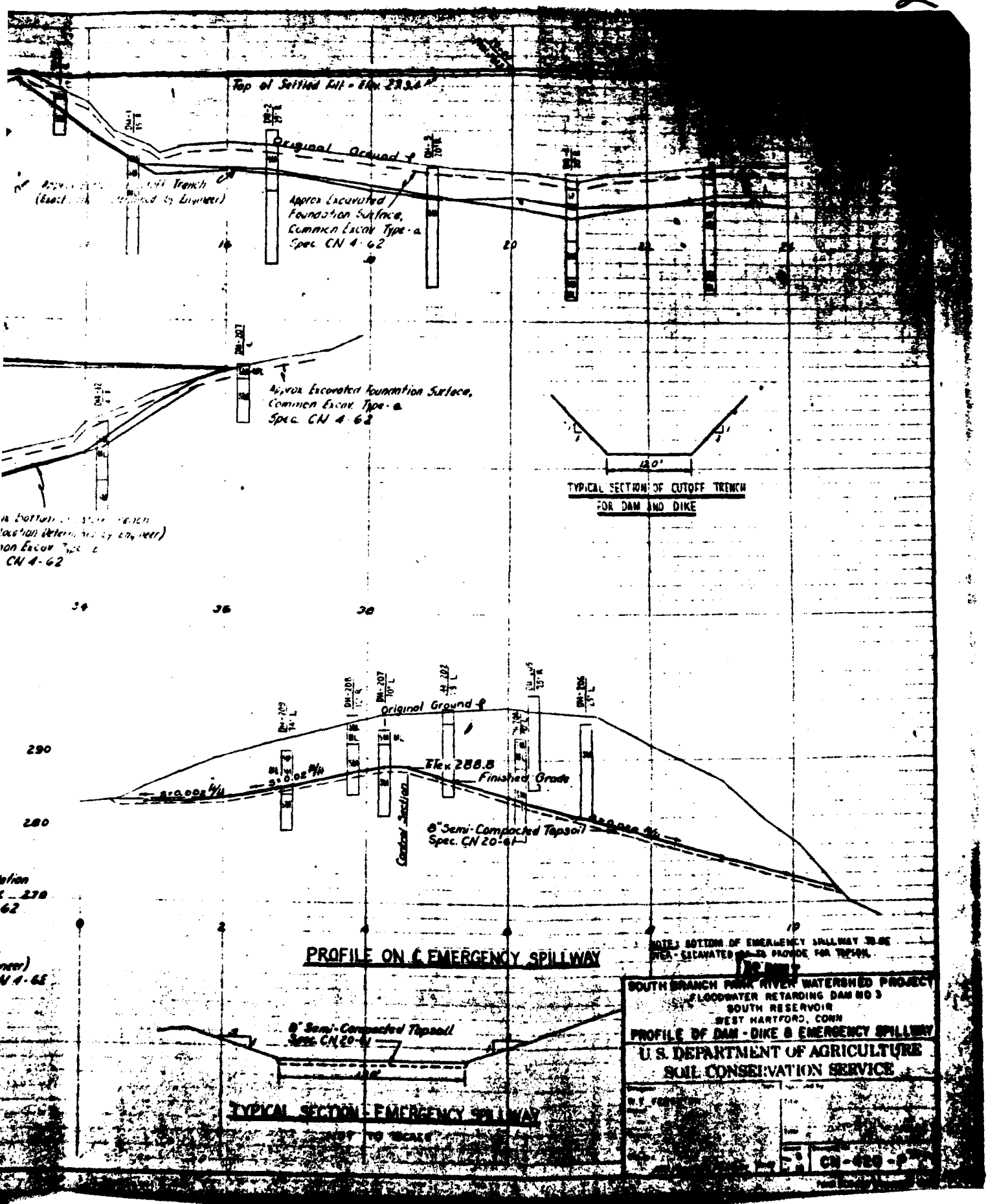
Deflection Angle · 5° - 15'
℄ Ditch
℄ Ditch Relocation
To Existing Channel
PI #2 Relocation
Curve #2
D · 48°
T · 44.57
L · 85.31
Curve Data
Remains the Same
AS-BUILT
South
Reservoir
Conn.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

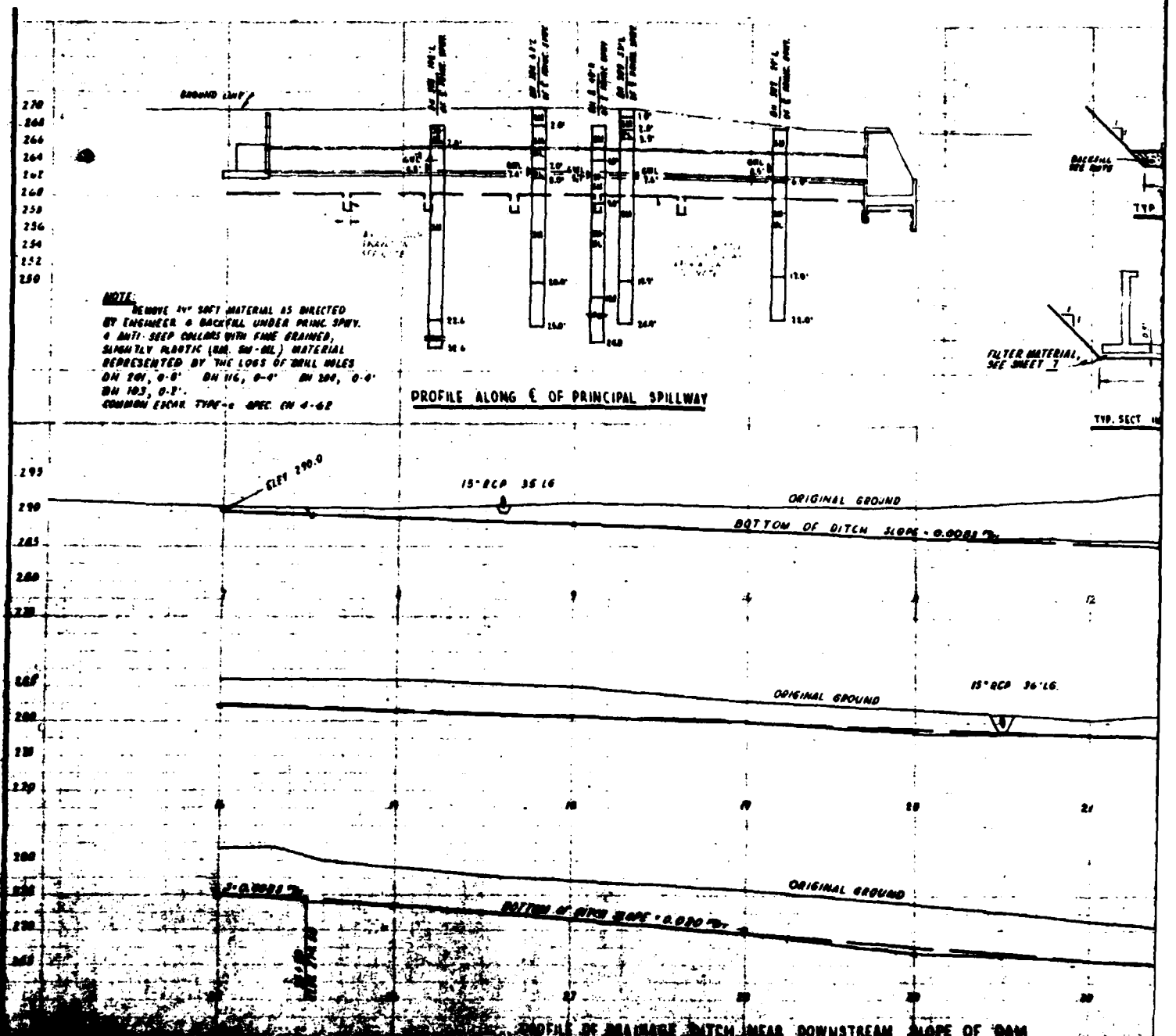

BORROW AREA "A"
BERM TOP OF CUT
TO DRAIN AWAY FROM
EMERGENCY SPILLWAY
CURVE #5
R = 200'
Δ = 30°
D = 28°-39'
T = 115.48
L = 104.70
LEVEL CONTROL SECTION
APPROX. LOCATION OF
CONCRETE MONUMENT
SEE DWG CN STD-D
CURVE #4
R = 200'

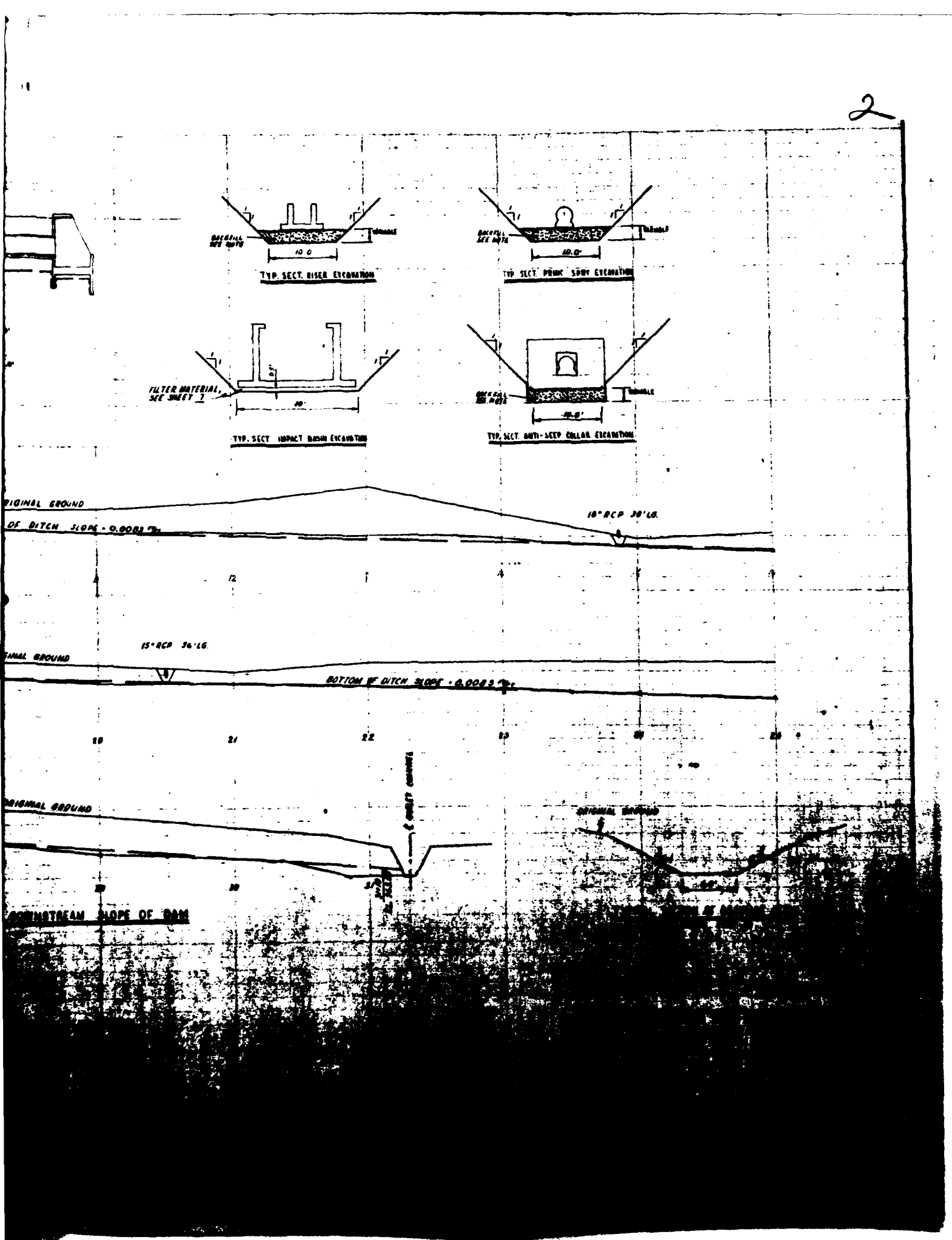

Abandoned
Existing 36"
RCP
Existing open channel
to be filled to level
of natural ground
Flared inlet to be
staked in the field.
N/F City of Hartford

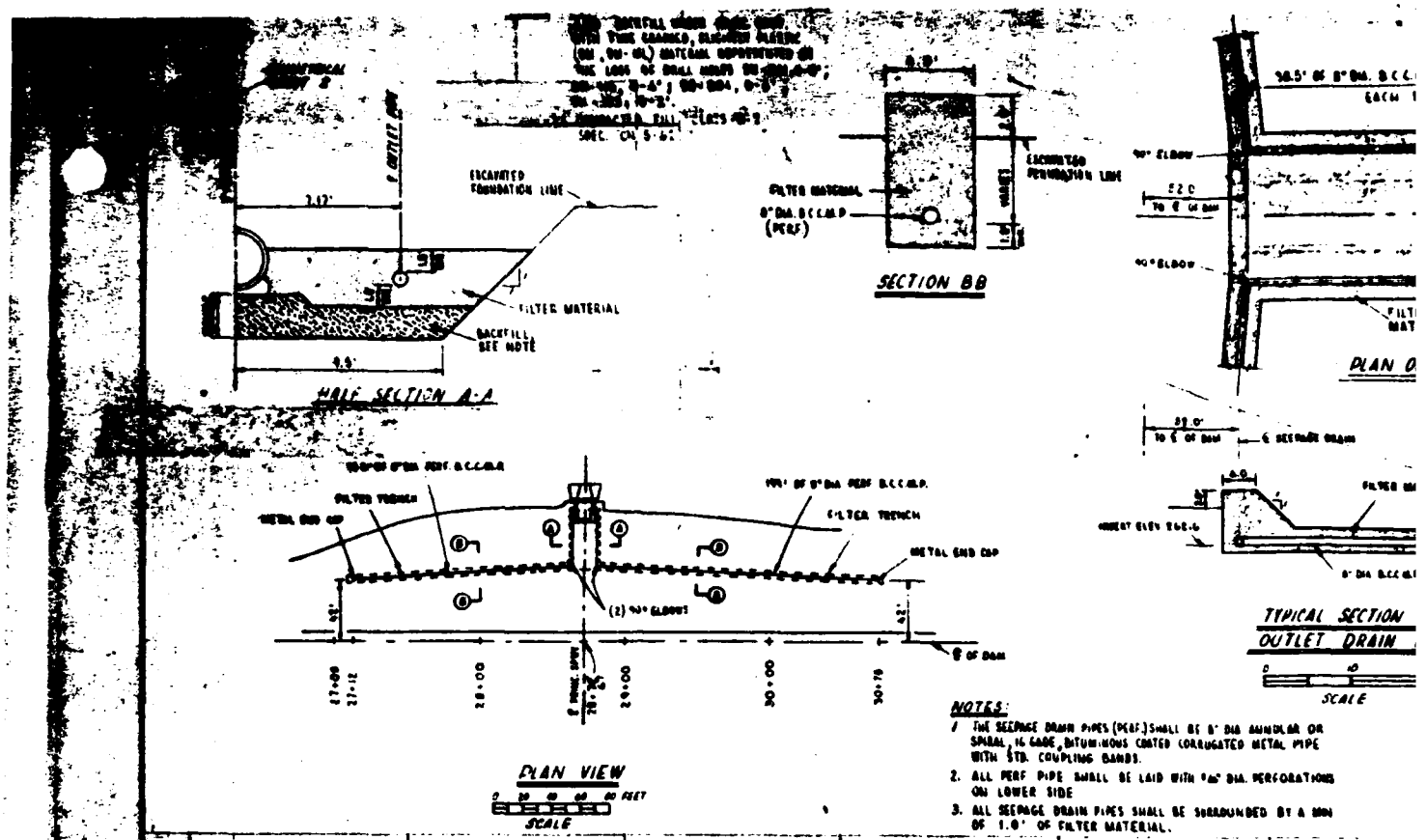

Top of Settled Fill = Elev. 293.4
Original Ground
Approx Bottom of Cutoff Trench
(Exact Location Determined by Engineer)
Common Excav Type b
Spec. CN 4-62
PROFILE ON ℄ OF DAM
Construction Elev 294.2
Top of Settled Fill = Elev. 293.4
Original Ground
Approx Excavated Foundation
Surface, Common Excav. Type a Spec. CN 4-62
Approx Bottom of Cutoff Trench
(Exact Location Determined by Engineer)
Common Excav Type b Spec. CN 4-62

2


Top of Settled Fill - Elev 293.4
Original Ground
Approx Excavated Foundation Surface, Common Excav Type - a Spec. CN 4-62
Approx Excavated Foundation Surface, Common Excav Type - a Spec. CN 4-62
CN 4-62
40'
TYPICAL SECTION OF CUTOFF TRENCH FOR DAM AND DIKE
Original Ground
Elev 288.8
Finished Grade
Center Section
6" Semi-Compacted Topsoil Spec. CN 20-61
PROFILE ON ℄ EMERGENCY SPILLWAY
6" Semi-Compacted Topsoil Spec. CN 20-61
TYPICAL SECTION EMERGENCY SPILLWAY
SOUTH BRANCH PARK RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 3
SOUTH RESERVOIR
WEST HARTFORD, CONN
PROFILE OF DAM - DIKE & EMERGENCY SPILLWAY
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CN-420-P

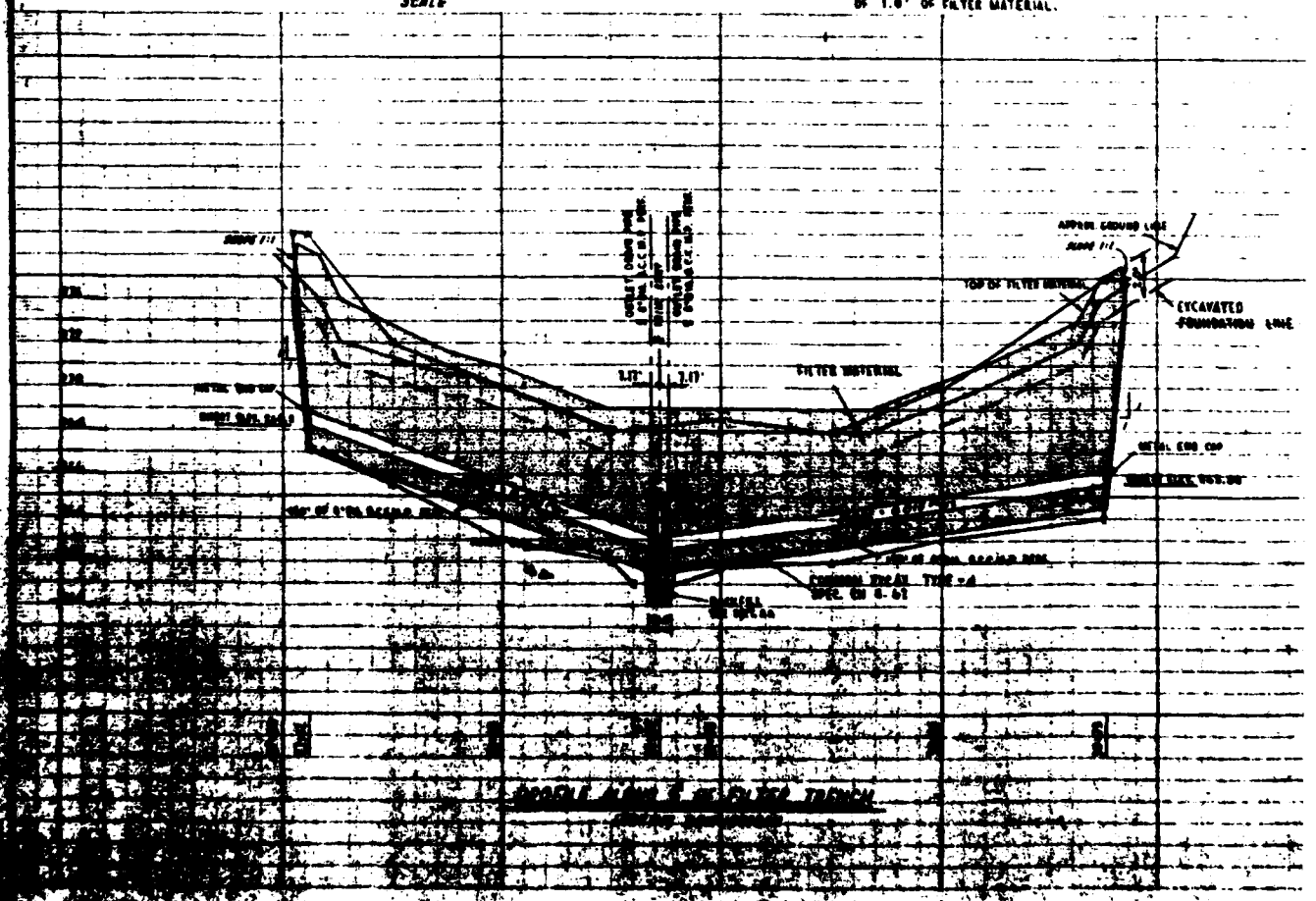

GROUND LINE
NOTE:
REMOVE 1½' SOFT MATERIAL AS DIRECTED BY ENGINEER & BACKFILL UNDER PRINC. SPWY. & ANTI-SEEP COLLARS WITH FINE GRAINED, SLIGHTLY PLASTIC (SM-SC) MATERIAL
REPRESENTED BY THE LOGS OF DRILL HOLES
DH 201, 0-8' DH 116, 0-4' DH 104, 0-4'
DH 103, 0-2'.
COMMON EXCAV. TYPE-a SPEC. CH 4-62
PROFILE ALONG ℄ OF PRINCIPAL SPILLWAY
FILTER MATERIAL, SEE SHEET 7
TYP. SECT
ELEV 290.0
15" RCP 35 LG
ORIGINAL GROUND
BOTTOM OF DITCH SLOPE = 0.0088 ft/ft
15" RCP 36' LG.
ORIGINAL GROUND
ORIGINAL GROUND
BOTTOM OF DITCH SLOPE = 0.020 ft/ft
PROFILE OF DRAINAGE DITCH NEAR DOWNSTREAM SLOPE OF DAM

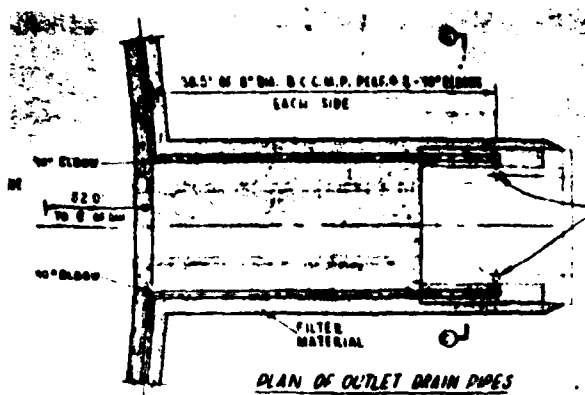

TYP. SECT. RISER EXCAVATION
TYP. SECT. PRINC. SPWY EXCAVATION
FILTER MATERIAL, SEE SHEET 7
TYP. SECT. IMPACT BASIN EXCAVATION
TYP. SECT. ANTI-SEEP COLLAR EXCAVATION
ORIGINAL GROUND
OF DITCH SLOPE = 0.0083 ft/ft
18" RCP 38' LG.
15" RCP 36' LG.
BOTTOM OF DITCH SLOPE = 0.0083 ft/ft
ORIGINAL GROUND
ORIGINAL GROUND
DOWNSTREAM SLOPE OF DAM



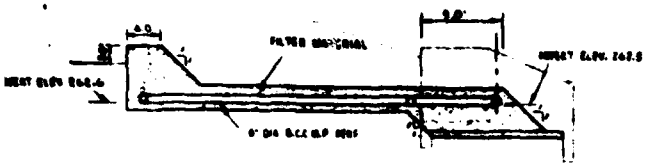
NOTES:

1. THE SEEPAGE DRAIN PIPES (PERF.) SHALL BE 8" DIA ANNULAR OR SPIRAL, 16 GAGE, BITUMINOUS COATED CORRUGATED METAL PIPE WITH STD. COUPLING BANDS.
2. ALL PERF PIPE SHALL BE LAID WITH ½" DIA. PERFORATIONS ON LOWER SIDE
3. ALL SEEPAGE DRAIN PIPES SHALL BE SURROUNDED BY A MIN OF 1.0' OF FILTER MATERIAL.



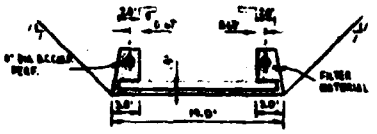


PLAN OF OUTLET DRAIN PIPES



TYPICAL SECTION ALONG OUTLET DRAIN PIPE

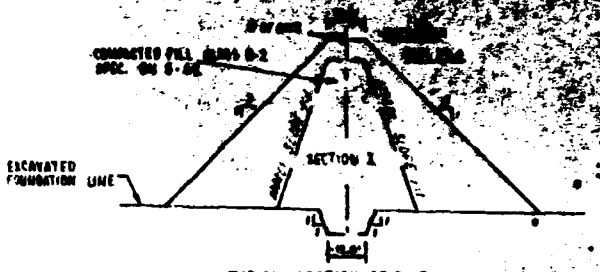
SCALE



SECTION CC

PLACE FINER, MORE PLASTIC MATERIALS IN CENTRAL PORTION OF FILL (SECTION Y) 4 IN CUTOFF TRENCH.

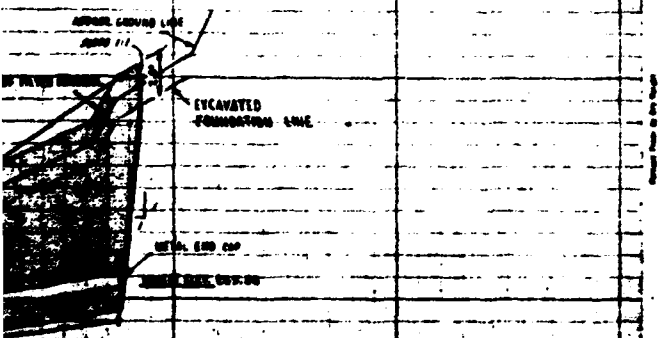
TYPICAL SECTION OF DIKE



TYPICAL SECTION OF DIKE

GRAIN SIZE DISTRIBUTION GRAPH

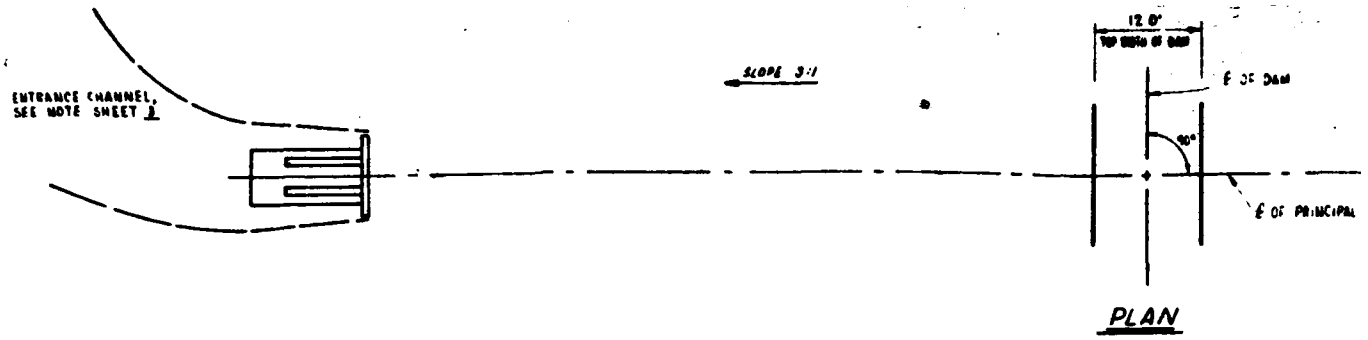
Sieve No.	% Passing
3"	100
1½"	80 - 100
1"	70 - 100
¾"	65 - 85
⅜"	57 - 79
No. 4	48 - 68
No. 10	32 - 46
No. 30	15 - 28
No. 50	4 - 19
No. 100	0 - 11
No. 200	2 - 5



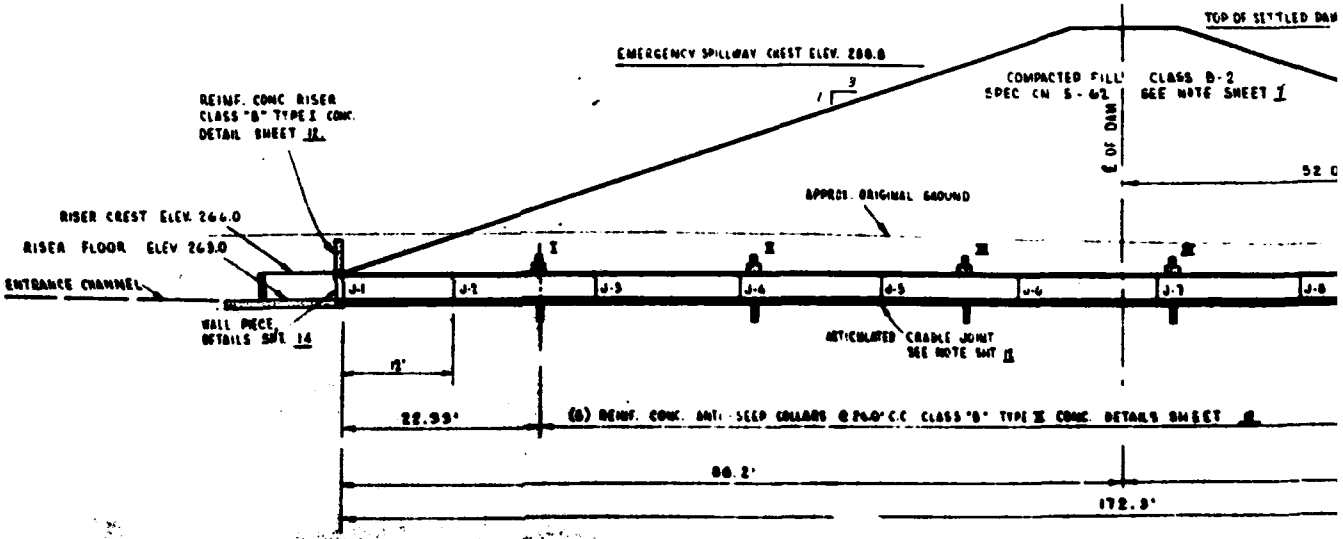
SOUTH BRANCH PARK RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 5
SOUTH RESERVOIR
WEST HARTFORD, CONN.

SEEPAGE DRAIN DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



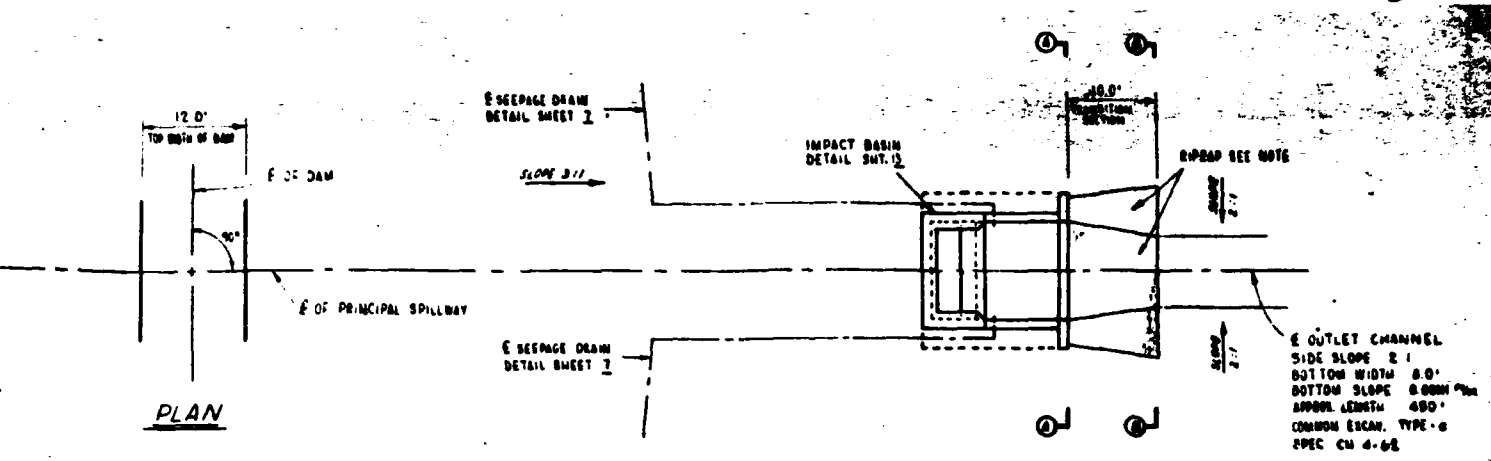
PLAN



PROFILE ALONG ℄ OF PRINCIDAL SPI

SEE SHEET 4 FOR PROFILE OF ORIGINAL GROUND ALONG ℄ OF DAM AND ALONG ℄

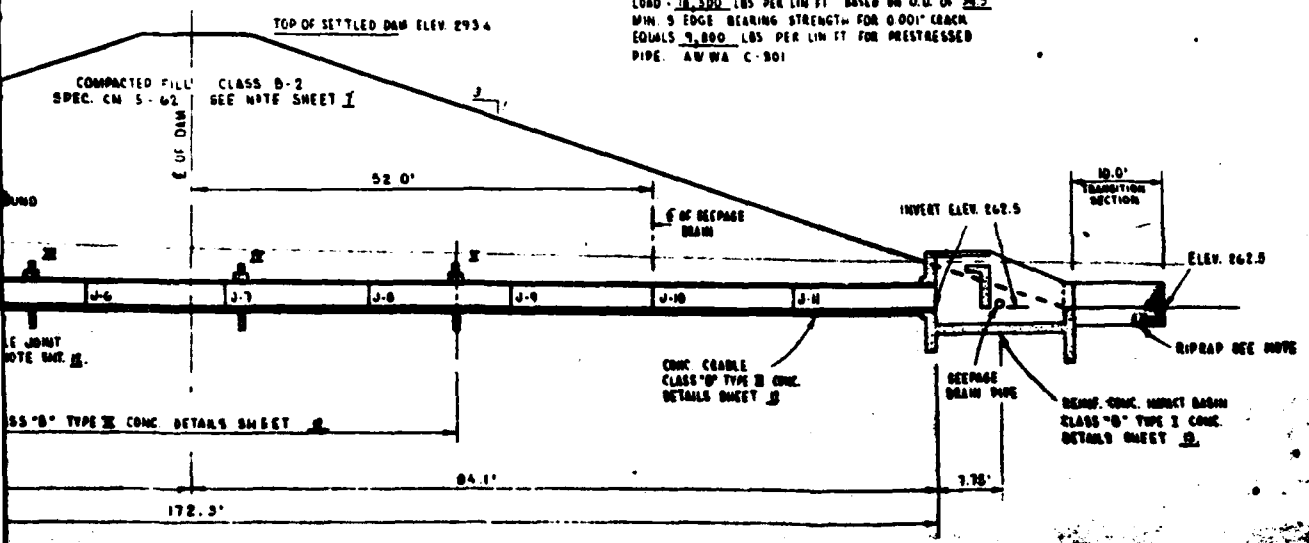
2



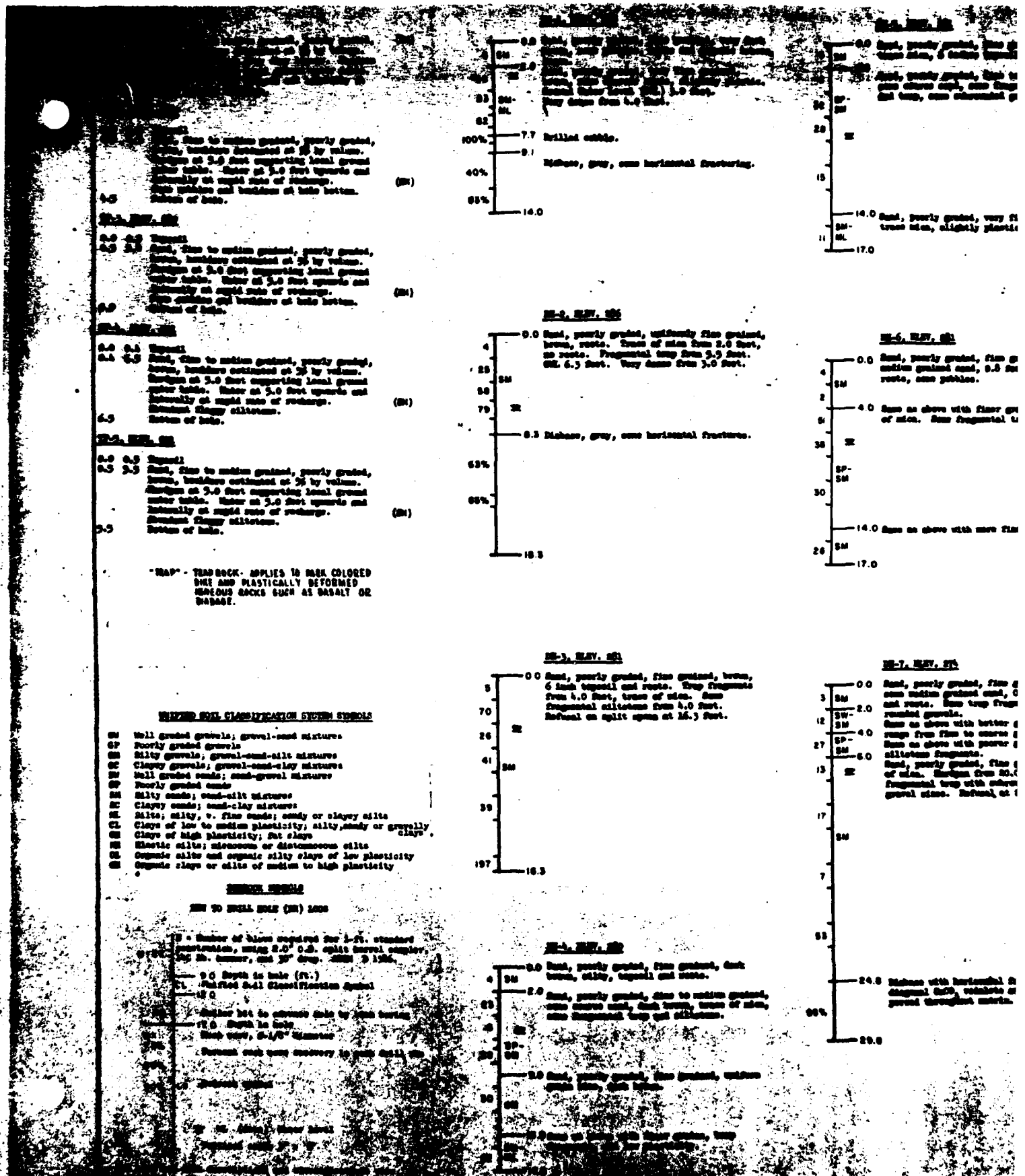
PLAN

30" DIA. REINF CONC WATER PIPE
10 16'-0" SECTIONS
1 12'-0" SECTION
1 WALL PIECE FOR 90° WALL
TOTAL LENGTH 173.17'
PRESSURE HEAD = 16.9'
LOAD = 18,300 LBS PER LIN FT BASED ON O.D. OF 34.5'
MIN. 3 EDGE BEARING STRENGTH FOR 0.001" CRACK
EQUALS 9,800 LBS PER LIN FT FOR PRESTRESSED
PIPE. AWWA C-301

PIPE SUPPLIERS NOTE:
CAST OUTSIDE OF SPIGOT
JOINT RING WITH CONCRETE
ON ONE 16' SECTION



℄ ALONG ℄ OF PRINCIPAL SPILLWAY



"TRAP" - TRAPROCK- APPLIES TO DARK COLORED DENSE AND PLASTICALLY DEFORMED IGNEOUS ROCKS SUCH AS BASALT OR DIABASE.

UNIFIED SOIL CLASSIFICATION SYSTEM SYMBOLS

GW Well graded gravels; gravel-sand mixture.
GP Poorly graded gravels
GM Silty gravels; gravel-sand-silt mixtures
GC Clayey gravels; gravel-sand-clay mixtures
SW Well graded sands; sand-gravel mixtures
SP Poorly graded sands
SM Silty sands; sand-silt mixtures
SC Clayey sands; sand-clay mixtures
ML Silts; silty, v. fine sands; sandy or clayey silts
CL Clays of low to medium plasticity; silty,sandy or gravelly clays
CH Clays of high plasticity; fat clays
MH Elastic silts; micaceous or diatomaceous silts
OL Organic silts and organic silty clays of low plasticity
OH Organic clays or silts of medium to high plasticity

B-5, ELEV. [illegible]

0.0 Sand, poorly graded, fine grained, brown, trace silt, 6 inches topsoil and roots.
2.0 Sand, poorly graded, fine to medium grained, some coarse sand, some fragmental siltstone and trap, some subrounded gravels.
14.0 Sand, poorly graded, very fine grained, trace silt, slightly plastic.
17.0

B-6, ELEV. [illegible]

0.0 Sand, poorly graded, fine grained, some medium grained sand, 0.5 foot topsoil and roots, some pebbles.
4.0 Same as above with finer grains and trace of silt. Some fragmental trap and siltstone.
14.0 Same as above with more fines.
17.0

B-7, ELEV. [illegible]

0.0 Sand, poorly graded, fine grained with some medium grained sand, 0.5 foot topsoil and roots. Some trap fragments, some subrounded gravels.
2.0 Same as above with better grading. Sands range from fine to coarse grained.
4.0 Same as above with poorer grading. Some siltstone fragments.
6.0 Sand, poorly graded, fine grained, trace of silt. Medium from 20.0 feet. Abundant fragmental trap with subround pebbles and gravel sizes. Refusal at 24.8 feet.
24.8 Bedrock with horizontal fracturing, some diagonal CaCO3 veinlets and flakes dispersed throughout matrix.
29.8

B-8, ELEV. [illegible]

0.0 Sand, poorly graded, fine grained, with some silt, 1.0 foot topsoil and roots. Sands range from fine to coarse grained, some pebbles and fragmental trap.
4.0 Same as above except very fine to fine grained, relatively graded, traces of silt.
9.0 Same as above with some plasticity. Very dense from 0.8 feet, decomposed trap as major constituent from 18.0 feet.
19.8 Bedrock with $CaCO_3$ flakes dispersed throughout.
24.8

B-9, ELEV. [illegible]

0.0 Sand, fine grained, poorly graded, brown, some pebbles, trace of silt. Better grading of sand ranging to coarse from 2 to 4 feet, some grey silt. Fine grained beyond 4.0 feet, some pebbles and siltstone fragments beyond 4.0 feet.
8.0 Sand, very fine grained, slightly plastic changing rapidly into medium to coarse grained sand.
17.5 Sand, fine grained, poorly graded, brown, some medium to coarse sand, abundant trap fragments. Refusal at 23.1 feet.
21.0
23.1 Bedrock, grey, some horizontal fractures.
28.1

B-10, ELEV. [illegible]

0.0 Sand, fine to medium grained, poorly graded, some coarse grained sand, grains angular to sub-angular, brown, silty, pebbles, rocks, trap fragments. 4 inches topsoil.
2.0 Sand, almost as above - SM-SW by sieve analysis - some siltstone fragments, no rocks or trap fragments.
8.0 Sand, fine grained, poorly graded, medium grain size, brown, slightly plastic, trace silt, some siltstone and trap fragments. Trace trap and decomposed trap fragments from 35.0'.

B-101, ELEV. [illegible]

0.0 Sand, very fine grained, poorly graded, brown, trace of silt and clay, slightly plastic.
2.0 Sand, fine grained, poorly graded, brown with some red, trap and siltstone fragments. More abundant rock fragments from 6.0 feet.
15.0

B-102, ELEV. [illegible]

0.0 Sand, fine grained, poorly graded, brown, some fragmental trap, slightly plastic.
2.0 Sand as above without plasticity. Abundant fragmental siltstone from 4.0 feet. Refusal on coring at 9.5 feet.
9.5

AS-BUILT

SOUTH BRANCH PARK RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 3
SOUTH RESERVOIR
WEST HARTFORD, CONN.
LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

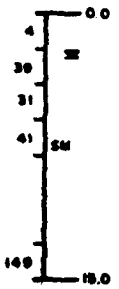
Designed — Date
Drawn — Traced
C.H. BRADLEY — Sept '59
Checked
J. Fahey — 9/60
Submitted — Title
Approved — Date
Sheet — Drawing No. CN-480-2

BH-101, ELEV. 305.1

0.0 Sand, fine grained, poorly graded, brown, roots and woody fragments, slightly plastic.

2.0 Same as above without roots and woody fragments, less plasticity. Siltstone and trap fragments from 4.0'. Pebbles and quartz fragments from 11.0 feet.

BH-104, ELEV. 306.7

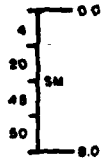


Sand, fine grained, poorly graded, dark reddish brown, abundant fragmental siltstone, some pebbles. Some trap from 4.0 feet. Refusal on coring at 19.5 feet.

BH-105, ELEV. 305.1

Sand, fine grained, poorly graded, brown, some siltstone fragment and quartz pebbles, some coarse from 4 to 6 feet gradating to fine grained at 8 feet. Some siltstone fragments from 8 feet.

BH-107, ELEV. 313.9



0.0 Sand, fine grained, poorly graded, brown, fragmental siltstone and trap. Trace of clay from 4 to 6 feet. Refusal on coring at 15.0 feet.

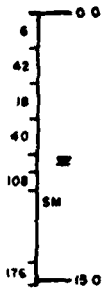
BH-108, ELEV. 317.3

0.0 Sand, fine grained, poorly graded, brown, some sub-angular gravel size, trace of silt, some minor siltstone inclusions in a fine sand matrix. Abundant fragmental siltstone and trap from 4 feet. Packed cobble from 6 feet - 150 blows on sample spoon for 6 inch penetration. Sand somewhat coarser from 16 feet. Larger pieces of fragmental trap from 21 feet. Refusal at 23.5 feet.

BH-109, ELEV. 307.9

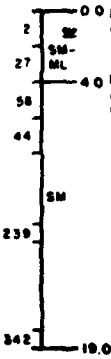
0 Sand, fine grained, poorly graded, brown, trace of silt, abundant fragmental siltstone and trap.

BH-111, ELEV. 277.1



0.0 Sand, fine grained poorly graded, some quartz pebbles, some fragmen stone, slightly plastic, trace of 4 to 6 feet, some sub-angular gra pebbles from 6 feet. Refusal at 1

BH-112, ELEV. 289.0



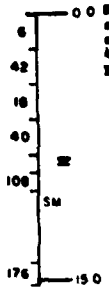
Sand, fine grained, poorly graded, some organic traces slightly plast

Same as above without plasticity, sand, fragmental and decomposed r 6 feet. Refusal at 19 feet.

BH-113, ELEV. 281.0

Sand, fine grained, poorly graded, slightly micaceous, very slight pl some pebbles and siltstone fragmen Abundant "lime" at 10 feet. Refu 10.8 feet.

SB-111, ELEV. 577.1



Sand, fine grained poorly graded, brown, some quartz pebbles, some fragmental siltstone, slightly plastic, trace of clay from 4 to 6 feet, some sub-angular quartz pebbles from 6 feet. Refusal at 15.5 feet.

SB-112, ELEV. 569.0

Sand, fine grained, poorly graded, brown, some organic traces slightly plastic.

Same as above without plasticity, some coarse sand, fragmental and decomposed rock from 6 feet. Refusal at 19 feet.

SB-113, ELEV. 569.0

Sand, fine grained, poorly graded, brown, slightly cohesive, very slight plasticity, some pebbles and siltstone fragments. Boulder "limy" at 10 feet. Refusal at 10.8 feet.

SB-114, ELEV. 570.2

Sand, fine grained, poorly graded, brown, some small siltstone and trap fragments. Occasional quartz fragments and trace of clay from 6 feet. Abundant trap fragments from 10 feet. Refusal at 16 feet.

SB-116, ELEV. 565.0

Sand, fine grained, poorly graded, dark brown, slightly plastic, some fragmental trap and siltstone, trace of clay.

Same as above without plasticity. Small limestone seams in fragmental rock, "limy" sample. Refusal at 14.3 feet

SB-117, ELEV. 562

Sand, very fine to fine grained, poorly graded, brown, some pebbles and siltstone fragments, trace of clay, some plasticity. More fragmental rock from 4 feet.

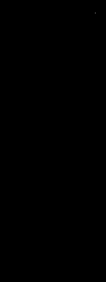
Same as above without plasticity and some fragmental rock.

SB-118, ELEV. 562

Sand, fine grained, poorly graded, brown to dark brown, sub-angular rock fragments, slightly plastic.

Same as above without the plasticity, some fragmental rock to 6 feet. Angular rock fragments from 4.0 feet.

SB-119, ELEV. 562



Sand, very fine grained, poor grading, very silty, trace of clay, some fragmental siltstone.

Same as above without plasticity, sand fine grained, more fragmental rock from 6 feet.

SB-120, ELEV. 562

Sand, fine grained, poorly graded, light brown, some silt, abundant fragmental rock, darker brown from 2 feet, siltstone and trap fragments throughout from 4 feet. Refusal at 13.0 feet.

SB-121, ELEV. 562

Sand, very fine grained, poorly graded, brown to dark brown, sub-angular rock fragments, slightly plastic.

Same as above without the plasticity, some fragmental rock to 6 feet. Angular rock fragments from 4.0 feet.

SB-122, ELEV. 562

Sand, fine grained, poorly graded, brown to dark brown, sub-angular rock fragments, slightly plastic.

Same as above without the plasticity, some fragmental rock to 6 feet. Angular rock fragments from 4.0 feet.

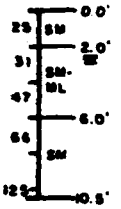
SB-123, ELEV. 562

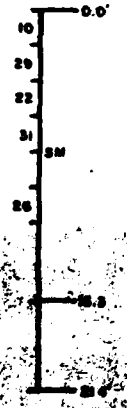
Sand, fine grained, poorly graded, brown to dark brown, sub-angular rock fragments, slightly plastic.

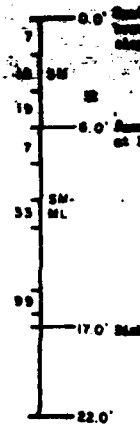
Same as above without the plasticity, some fragmental rock to 6 feet. Angular rock fragments from 4.0 feet.

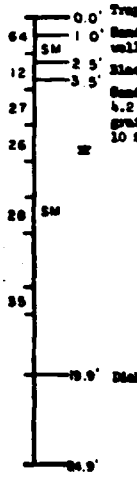

SM
12.0'


0.0'
SM-ML
6.0'
SM
11.0'


0.0'
SM
2.0'
SM-ML
6.0'
SM
10.5'

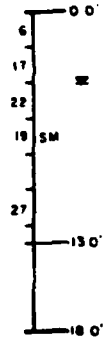

0.0'
SM
SM
16.5'


0.0'
SM
6.0'
SM-ML
17.0'
22.0'

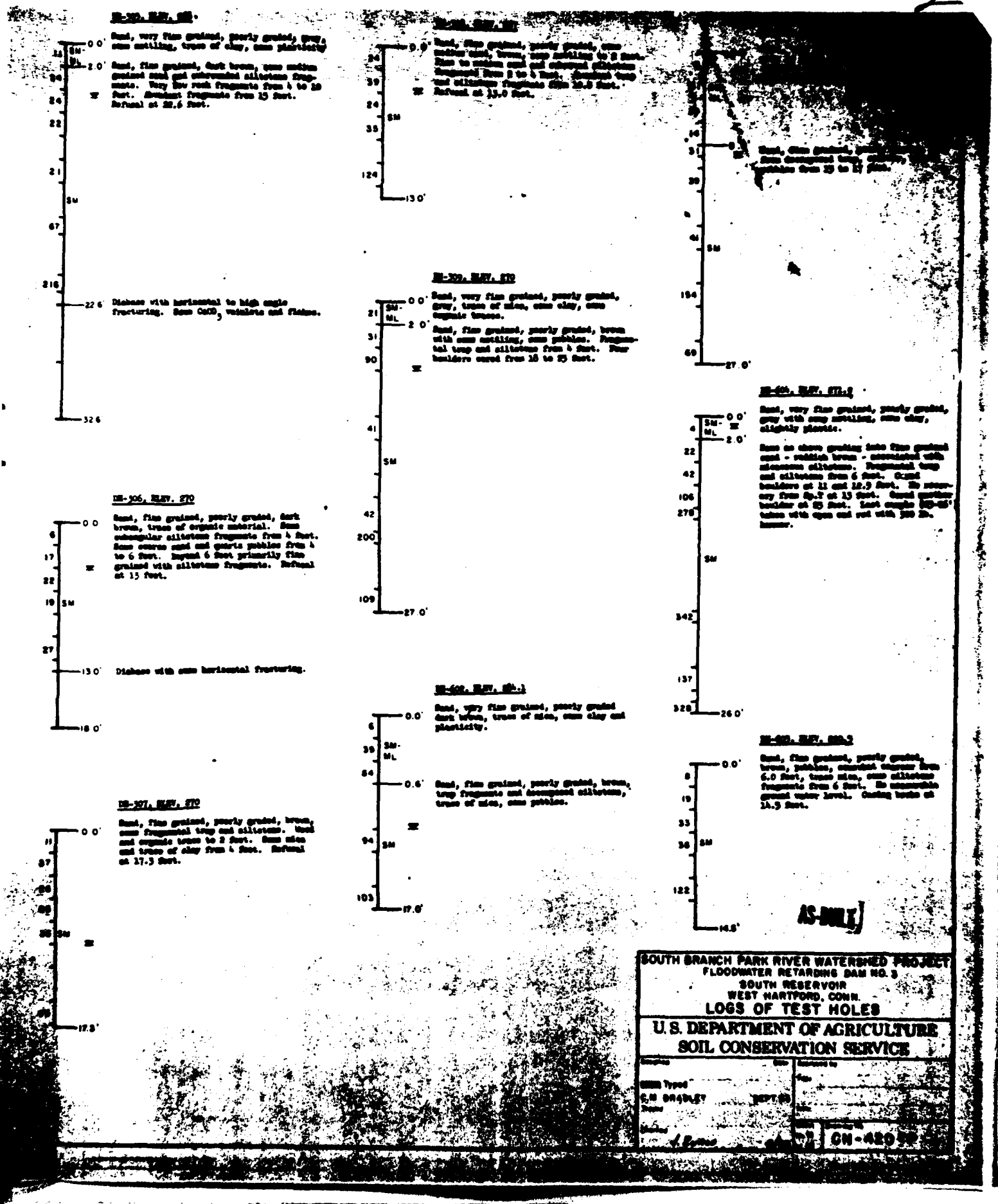

0.0'
1.0'
SM
2.5'
3.5'
19.9'
19.9'


0.0'
SM
2.0'
SM-ML
7.0'
8.0'
SM
20.0'


0.0'
SM-ML
8.0'
SM
22.6'
32.6'


0.0'
SM
13.0'
18.0'


0.0'
SM
12.8'



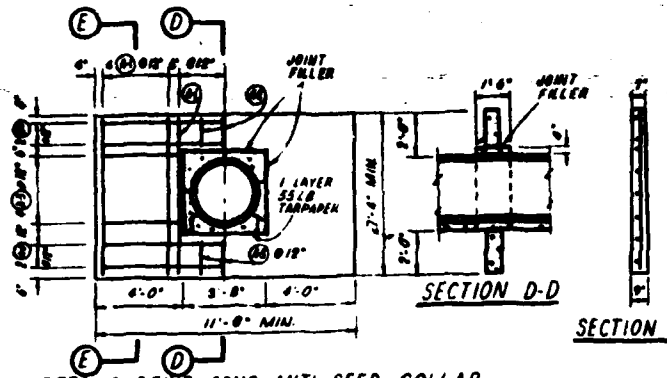
SOUTH BRANCH PARK RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 3
SOUTH RESERVOIR
WEST HARTFORD, CONN.

LOGS OF TEST HOLES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

AS-BUILT

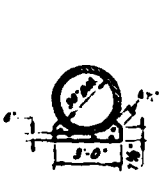
CN-420

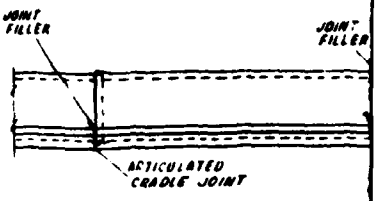


SECTION D-D

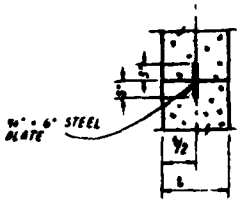
SECTION E-E

DETAILS REINF. CONC. ANTI-SEEP COLLAR





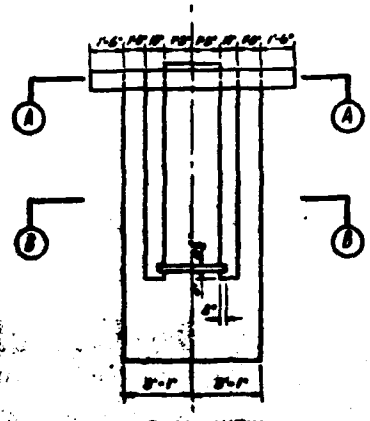
DETAIL OF CONCRETE BEDDING



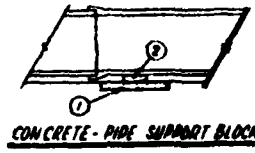
DETAIL OF PLATE CONSTRUCTION JOINT

GENERAL NOTES:

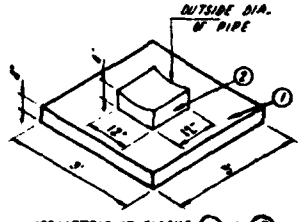
1. ALL CONCRETE SHALL BE CLASS "B" OR OF THE TYPE NOTED.
2. PORTLAND CEMENT TYPE IA OR TYPE I WITH AN AIR-ENTRAINING ADMIXTURE SHALL BE USED.
3. ALL REINF. STEEL TO BE LAPPED A MIN. OF 30 BAR DIAMETERS.
4. ALL REINF. STEEL PLACED IN CONCRETE POURED AGAINST THE GROUND SHALL HAVE A MIN OF 3" CLEAR COVER WHERE FORMS ARE USED BARS SHALL HAVE A MIN OF 2" CLEAR COVER
5. ALL EXPOSED EDGES OF CONCRETE TO HAVE A ¾" CHAMFER UNLESS OTHERWISE NOTED.
6. FIELD BEND ALL STEEL AROUND WALL PIECE.
7. ½" PREFORMED JOINT FILLER, BITUMINOUS TYPE, PER SPEC. ASTM D-994-49 OR C-994-58. PLACED AS SHOWN.



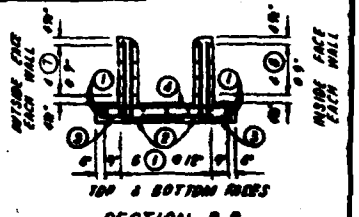
PLAN VIEW



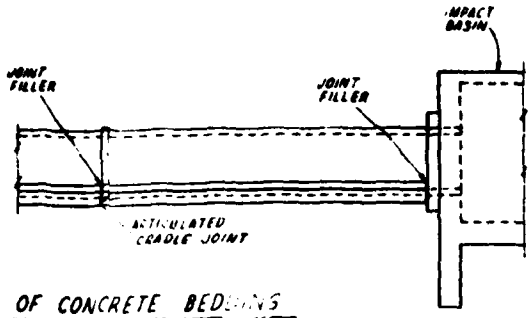
CONCRETE - PIPE SUPPORT BLOCKS



ISOMETRIC OF BLOCKS ① & ②

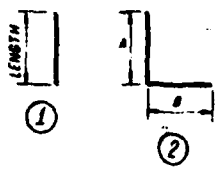


SECTION B-B



OF CONCRETE BEDDING

BAR TYPES



MARK	LOCATION	NUMBER	SIZE	LENGTH	TYPE	A	B	C	TOTAL WT.
1	RISER	16	5	19-9	1				318.50
2		18	5	6-1	2	3-8	3-8		189.30
3		18	5	3-10	2	1-8	3-8		97.20
4		18	6	3-9	1				283.50
5		2	5	3-10	2	3-8	3-8		12.67
6		2	5	6-7	2	1-8	3-8		13.77
7		8	5	9-8	2	0-8	9-0		75.33
8		8	5	8-8	1				66.00
9		12	5	8-9	1				105.00
10		20	6	3-9	1				78.00
A-1	COLLAR (8)	50	4	7-8	1				350.00
A-2		30	4	1-3	1				37.50
A-3		30	4	1-6	1				45.00
A-4		70	4	11-3	1				223.50
A-5		40	4	3-6	1				140.00

THIS SHEET ONLY

STEEL QUAN.

No 6 BARS 787 LIN FT 3527.3 LBS.
No 5 BARS 820.67 LIN FT 644.32 LBS.
TOTAL 1997.03 LBS.

CONCRETE QUAN.

CLASS "B" TYPE I 3.3 CU. YDS.
CLASS "B" TYPE II 10.3 CU YDS.
CLASS "B" TYPE III 12.3 CU YDS.

CLASS "B" 3 OF THE TYPE NOTED.
IA OR TYPE I WITH AN AIR-ENTRAINING
D.
LAPPED A MIN. OF 30 BAR DIAMETERS.
D IN CONCRETE POURED AGAINST THE
AMM OF 3" CLEAR COVER WHERE FORMS
HAVE A MIN OF 2" CLEAR COVER.
CONCRETE TO HAVE A ¾" CHAMFER
ED.
ROUND WALL PIECE
ER, BITUMINOUS TYPE, PER SPEC.
804-53. PLACED AS SHOWN.

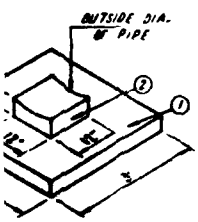
¾" x 1" EYE BOLT WITH 2¼" LENGTH SCREW THREAD AND WASHER.

4 - 1 PINE CREOSOTED (FULL PENETRATION) TIMBER 3" x 8" OR 10" x 3'-0" LONG (USE 4 - 3"x10"s OR 5 - 3"x8"s)

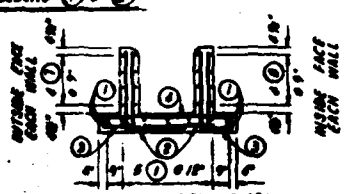
NOTE: BOTTOM OF BOTTOM BOARD AND TOP OF TOP BOARD NOT TO BE GROOVED OR BEADED.

DETAIL OF SLOT BOARDS
NOT TO SCALE

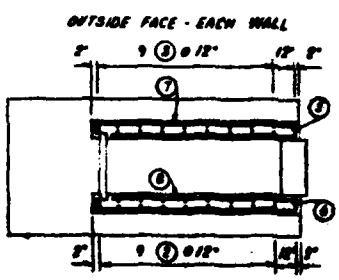
NOT TO BE PAID FOR



OF BLOCKS (1) & (2)

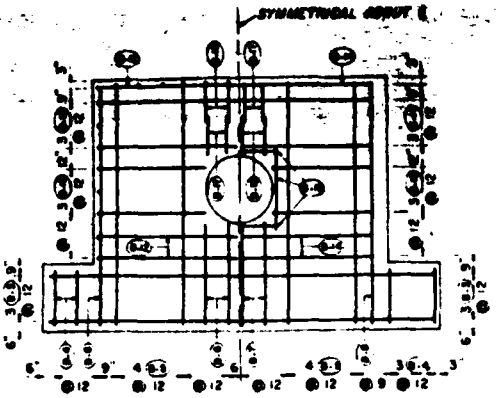


SECTION B-B

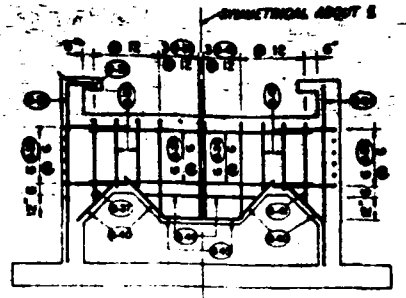


SECTION C-C

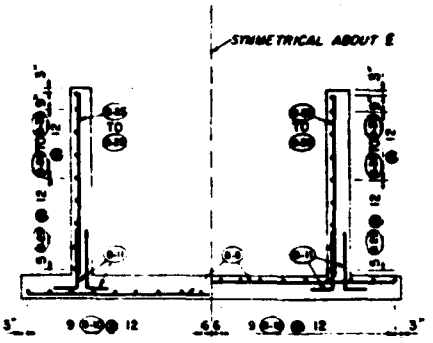
CONSTRUCTION JOINT



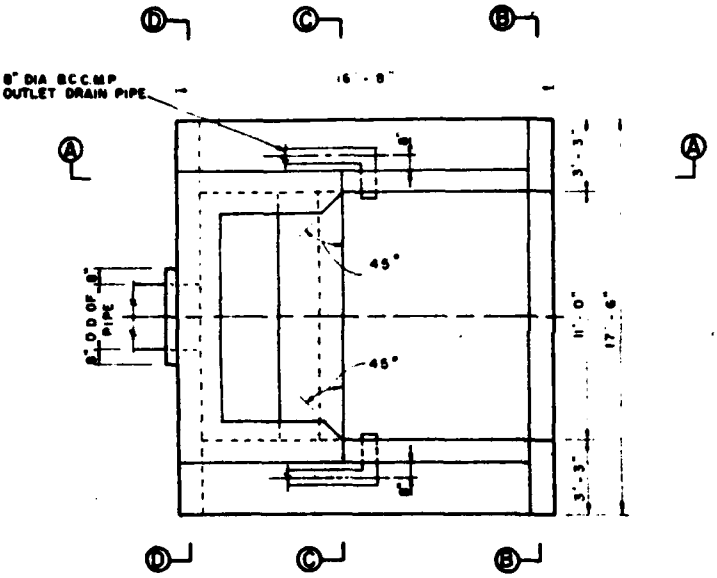
UPSTREAM FACE **SECTION D-D** DOWNSTREAM FACE



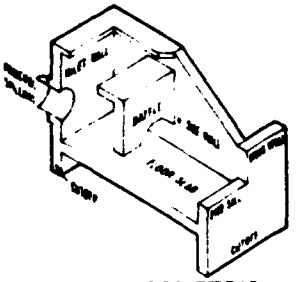
OUTSIDE FACE **SECTION THRU BAFFLE** INSIDE FACE



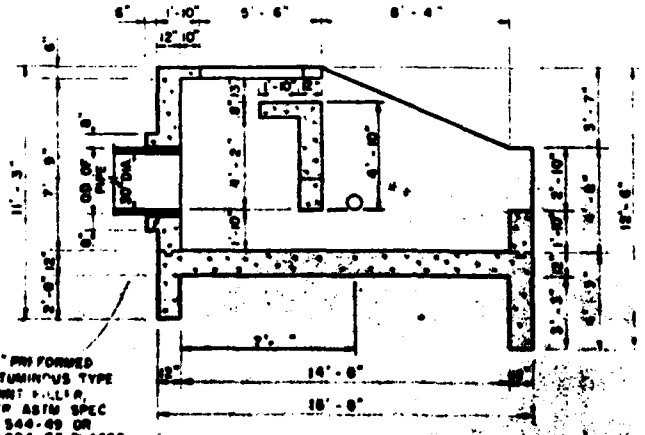
OUTSIDE FACE **SECTION C-C** INSIDE FACE



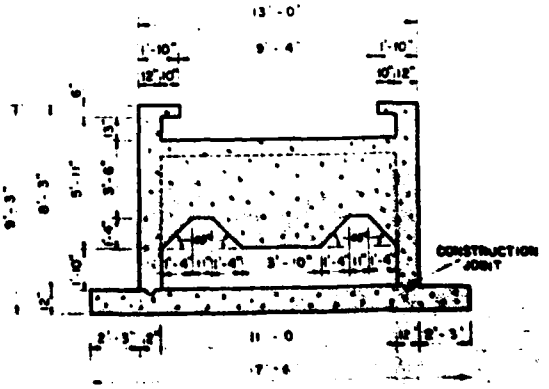
PLAN VIEW



HALF ISOMETRIC



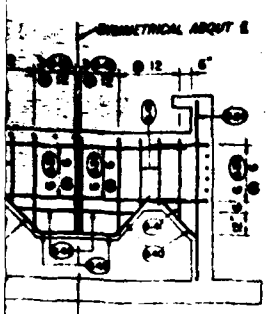
SECTION ON ℄



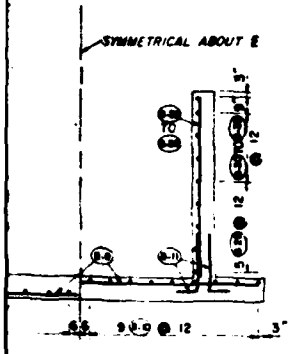
SECTION THRU BAFFLE

MAX. ALLOWABLE DISCHARGE = 125 CFS	ABOVE DIA. OF PIPE 48" DIA. 60" DIA.	GENERAL SEE SHEET

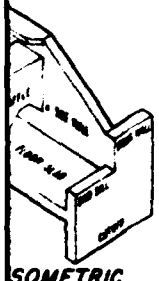
2



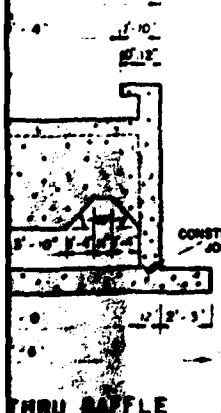
ON THRU BAFFLE INSIDE FACE



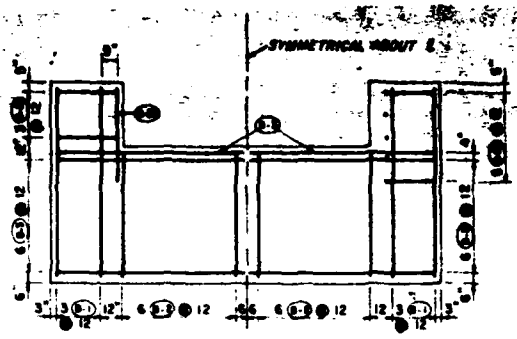
ECTION C-C INSIDE FACE



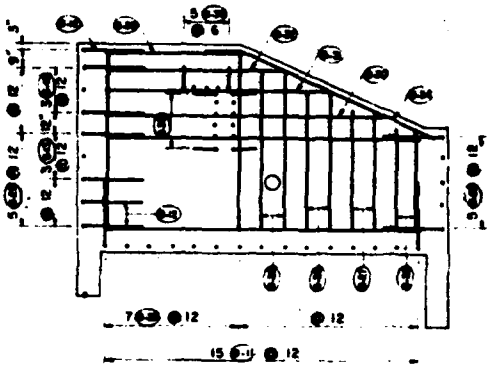
SOMETRIC



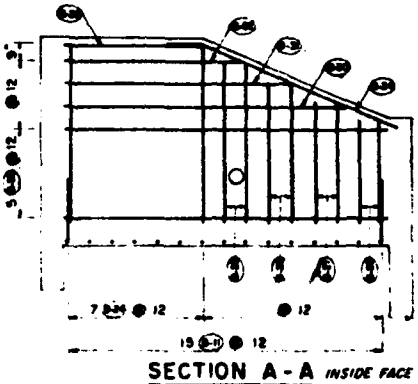
THRU BAFFLE



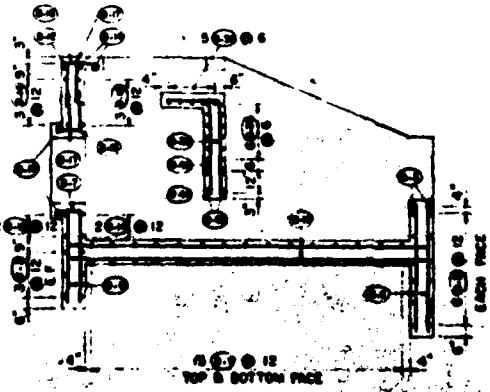
DOWNSTREAM FACE SECTION B-B UPSTREAM FACE



SECTION A-A OUTSIDE FACE



SECTION A-A INSIDE FACE



SECTION ON ℄

B-6		8	5	12				
		4	5	4-0				
7		4	5	5-3	10	4-3		
8		12	5	10-8	1			
9	FLOOR SLAB	30	5	17-6	1			
B-10		36	5	16-9	1			
B-11		60	5	3-9	2	8-9	4-0	
12	SHEET WALL	12	5	8-10	2	8-1	2-9	
13		6	5	7-3	2	6-6	2-9	
14		7	5	11-6	1			
B-15		6	5	5-3	2	4-3	1-0	
16		3	5	2-8	2	1-8	1-0	
17		7	5	1-9	1			
18		4	5	5-0	2	2-3	2-9	
19		4	5	3-9	1			
B-20	WING WALLS	2	5	4-3	1			
21		6	5	3-0	1			
22		10	5	5-0	2	2-3½	2-9	
23	SIDEWALLS	14	5	9-6	2	8-0	1-6	
24		14	5	8-0	1			
B-25		8	5	7-1	1			
26		8	5	6-3	1			
27		8	5	5-6	1			
28		8	5	4-6	1			
29		20	5	16-0	1			
B-30		4	5	12-6	1			
31		4	5	10-3	1			
32		4	5	7-9	1			
33		4	5	6-0	1			
34		4	5	11-1	3	9-6	1-7	
B-35	BAFFLE	8	5	3-9	2	2-9	1-0	
36		12	5	10-6	1			
37		2	5	6-7	2	4-0	2-7	
38		4	5	5-7	2	3-0	2-7	
39		5	5	6-10	2	4-3	2-7	
B-40		8	5	2-6	1			
41		2	5	4-0	1			
42		4	5	3-0	1			
43		5	5	4-3	1			
44		2	5	5-6	1			
B-45		2	5	3-6	1			

BAR TYPES

QUANTITIES

REINFORCING STEEL:
NO 5 BARS 4085.3 LIN FT [illegible] LBS.

CONCRETE:
CLASS "B" TYPE I 30.44 CU. YDS.

SCALE

AS-BUILT

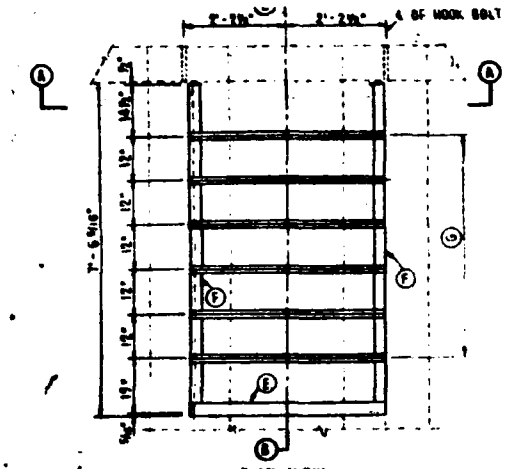
SOUTH BRANCH PARK RIVER WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 3
SOUTH RESERVOIR
WEST HARTFORD, CONN.
IMPACT BASIN DETAILS

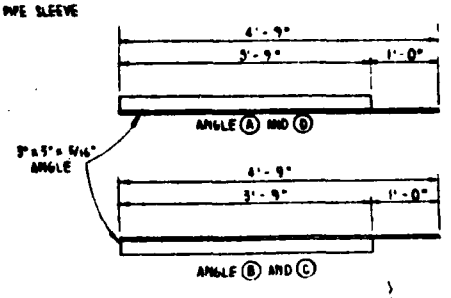
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

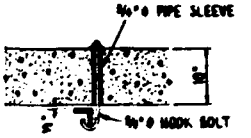
[illegible] DIA OF PIPE [illegible] 30" MIN.

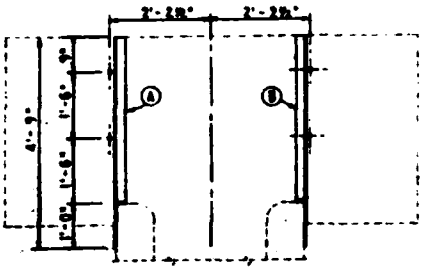
GENERAL NOTES, SEE SHEET 2

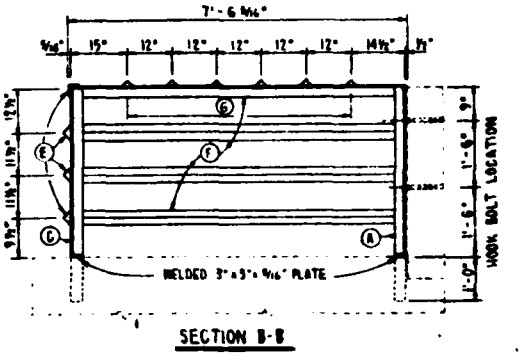
CN-420-P





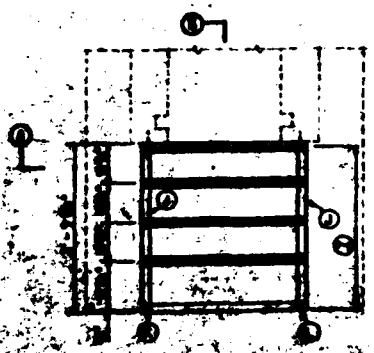


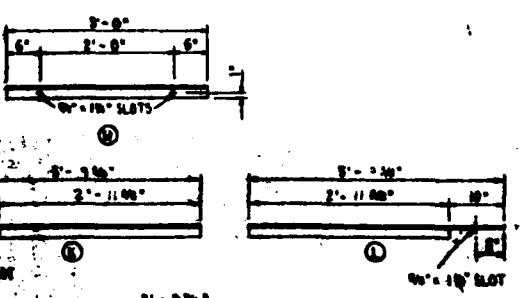


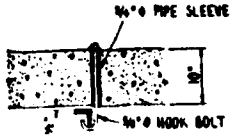


DETAILS OF TOP TRASH RACK

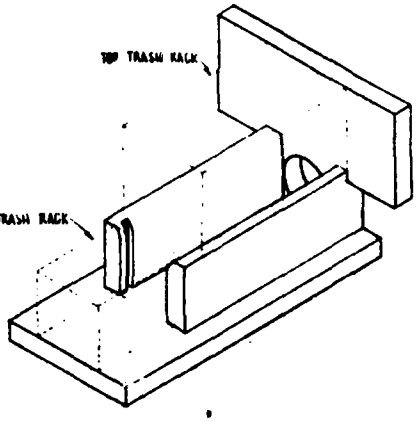
SCALE 0 1 2 3 4 FEET



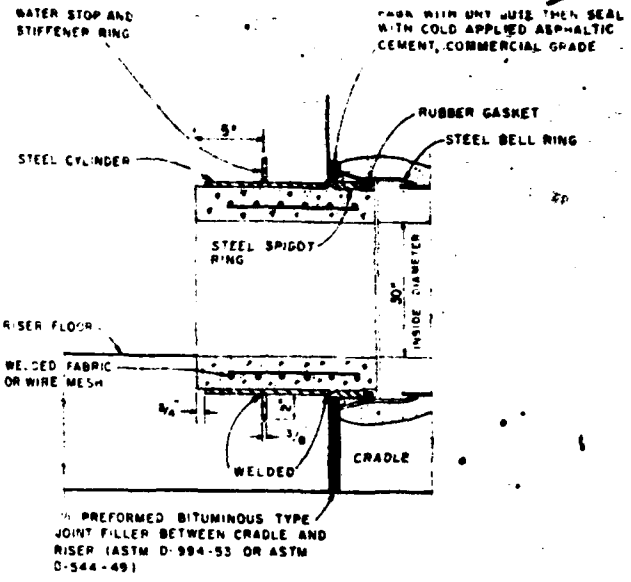




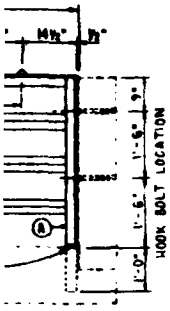
HOOK BOLT
FASTENING DETAILS

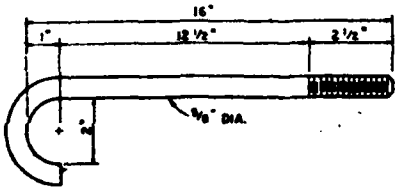


ISOMETRIC

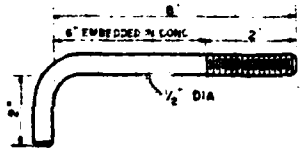


SPIGOT RING WALL FITTING

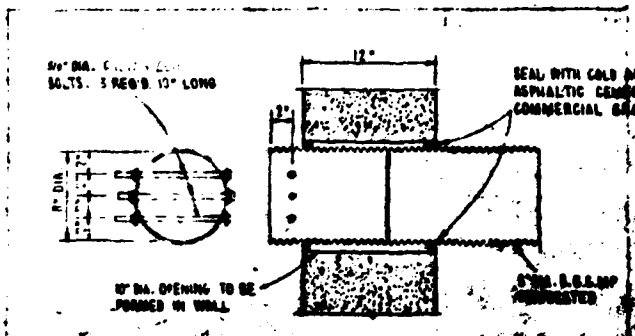




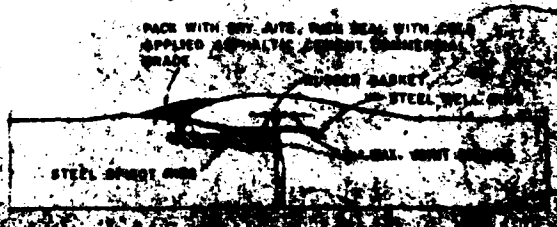
GALV. HOOK BOLT
SUPPLY WITH NUT AND WASHER

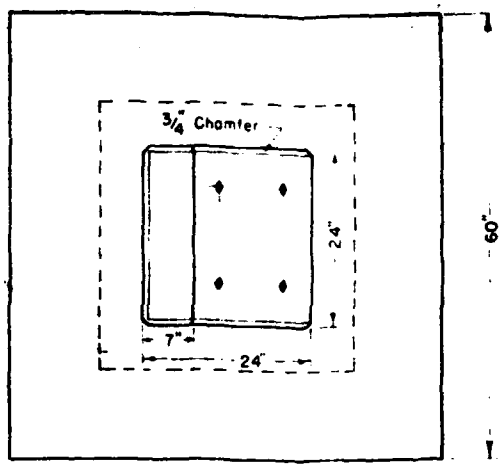


STAINLESS STEEL ANCHOR BOLT, AB-1
SUPPLY WITH NUT AND WASHER



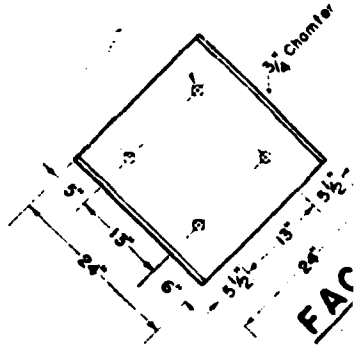
DETAIL OF SMALL ANIMAL GUARD



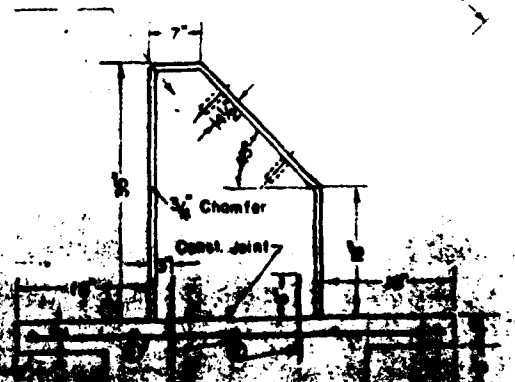


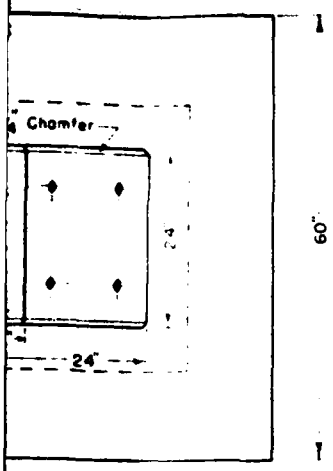
PLAN

4, 1¼" Diameter anchor holes for mounting a bronze plaque



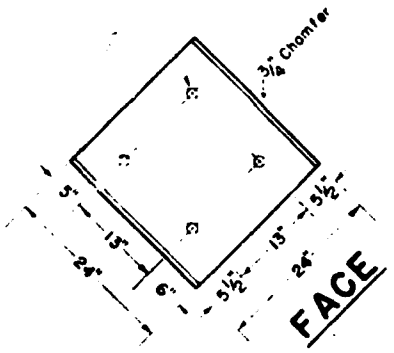
Carborundum - rubbed finish for exposed concrete surfaces



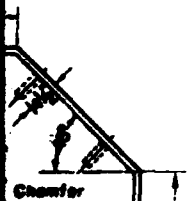


PLAN

4, 1¼ Diameter anchor holes for mounting a bronze plaque



Note: Location of concrete monument will be made by Construction Engineer on the site



Bar No.	Qty.	Length	Total Length	Size & Type
1	10	4'-10"	48' - 4"	[illegible]
2.	4	1'-0"	4' - 0"	[illegible]
Weight of size No. 3 steel = [illegible]				
Weight of size No. 4 steel = [illegible]				
Total class "B" concrete = [illegible]				

CONCRETE
[illegible] Cast

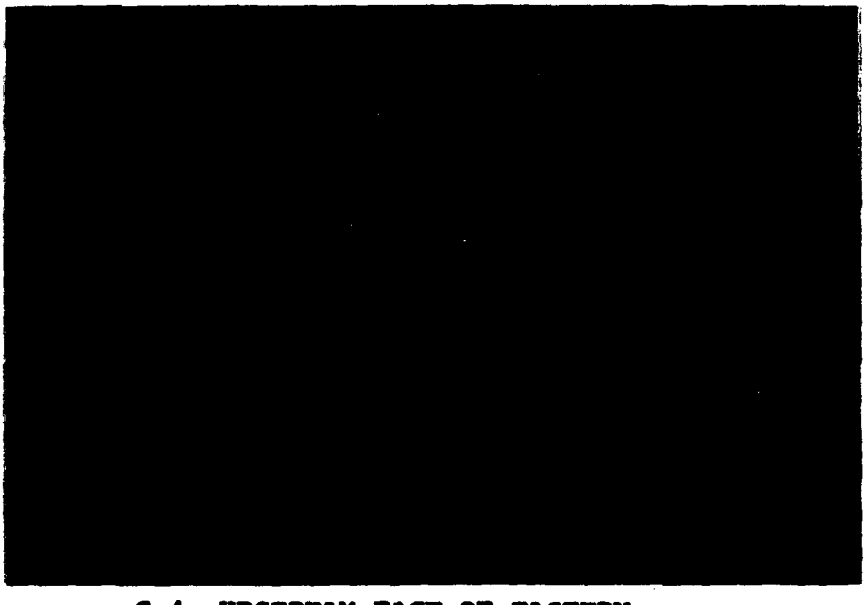
APPENDIX C

PHOTOGRAPHS

C-1 WESTERN END OF DAM - LOOKING EAST

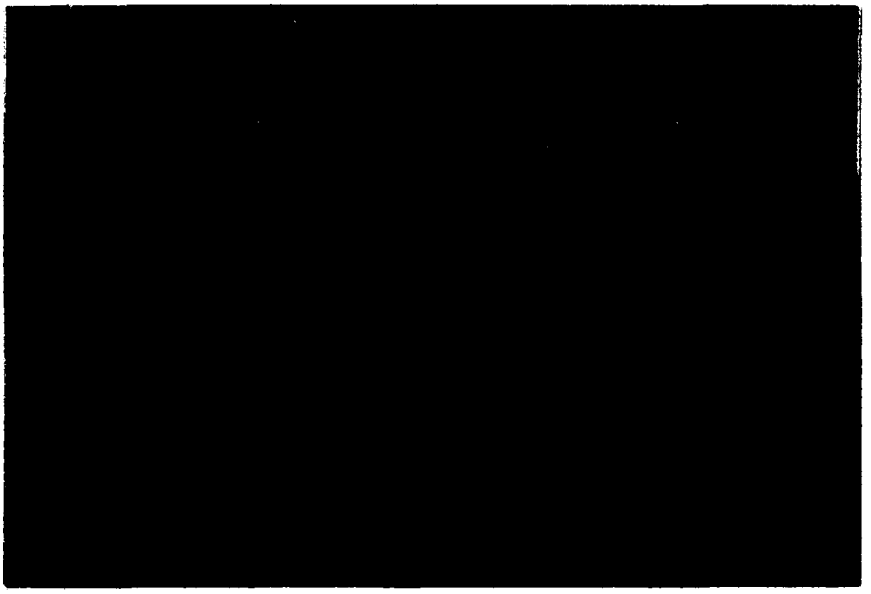
C-2 UPSTREAM FACE OF WESTERN SIDE OF DAM - LOOKING WEST

C-3 DOWNSTREAM FACE OF EASTERN SIDE OF DAM - LOOKING WEST

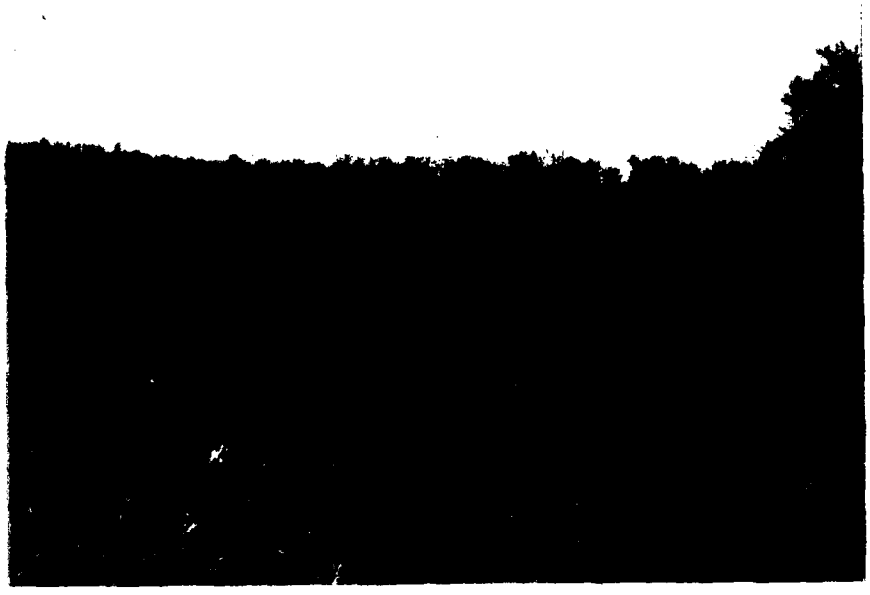


C-4 UPSTREAM FACE OF EASTERN SIDE OF DAM - LOOKING WEST

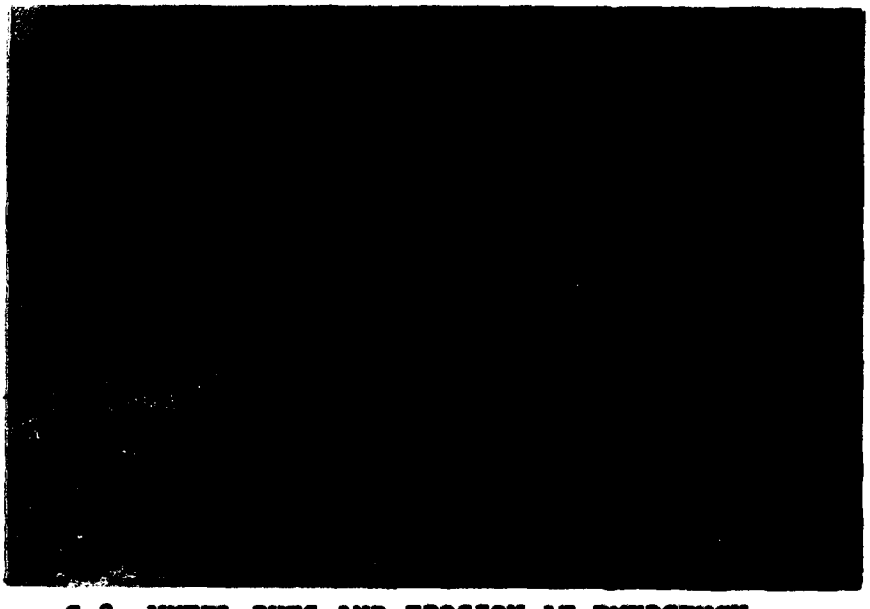
C-5 TOP OF WESTERN SIDE OF DAM - LOOKING WEST. NOTE WHEEL RUTS



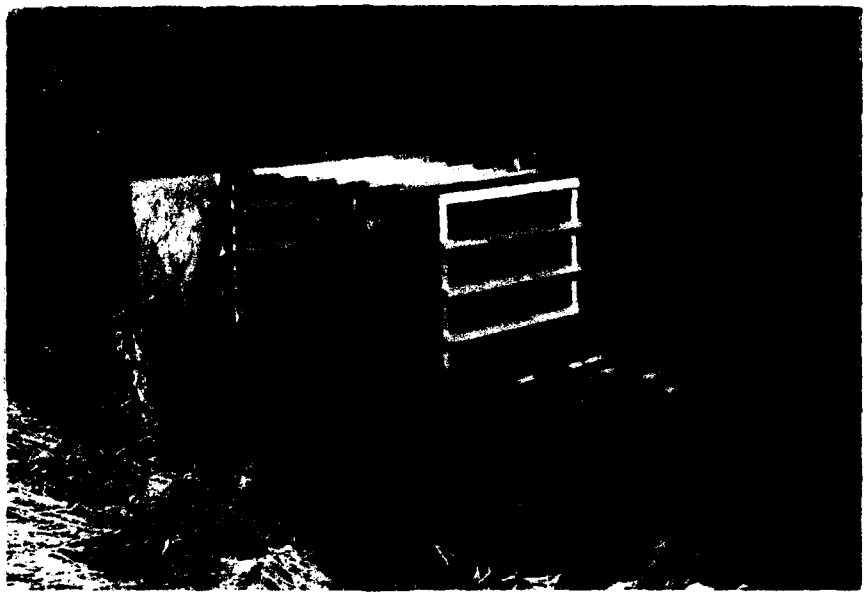
C-6 TOP OF EASTERN SIDE OF DAM - LOOKING EAST TO EMERGENCY SPILLWAY



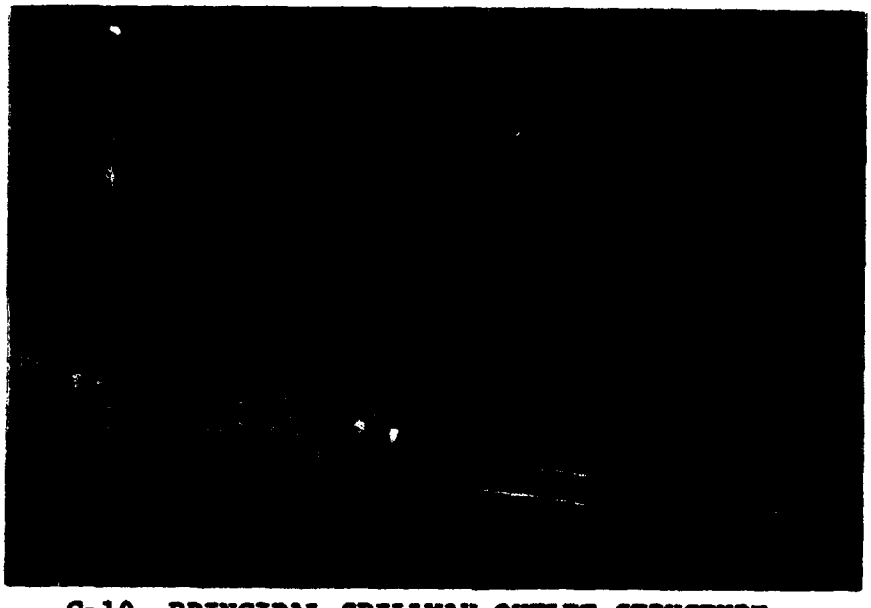
C-7 EMERGENCY SPILLWAY - LOOKING UPSTREAM FROM OUTLET END. NOTE WHEEL RUTS AND CORRESPONDING EROSION OF EMBANKMENTS.



C-8 WHEEL RUTS AND EROSION AT EMERGENCY SPILLWAY - LOOKING EAST AT EASTERN EMBANKMENT.



C-9 PRINCIPAL SPILLWAY INLET STRUCTURE



C-10 PRINCIPAL SPILLWAY OUTLET STRUCTURE AND DOWNSTREAM CHANNEL.

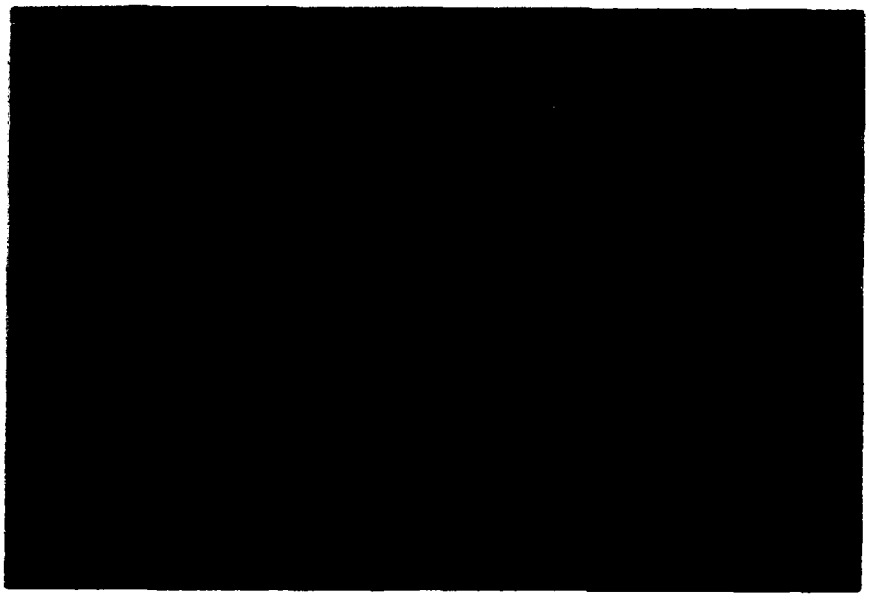
C-11 PRINCIPAL SPILLWAY OUTLET STRUCTURE. NOTE CONCRETE SLURRY OVER RIPRAP.

C-12 SETTLEMENT AND EROSION IN BACK OF PRINCIPAL SPILLWAY OUTLET STRUCTURE.

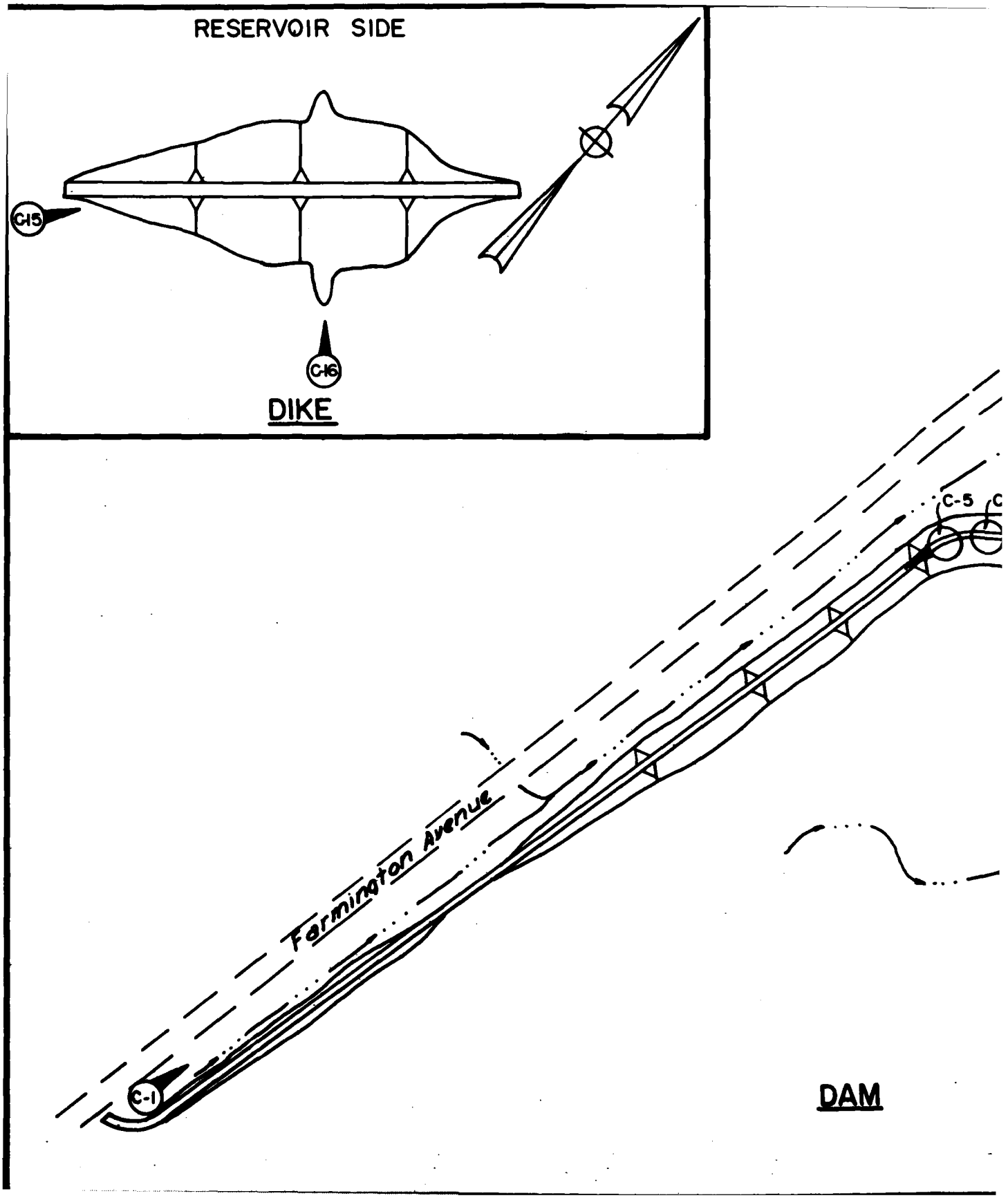
C-13 DEPRESSION IN EMBANKMENT BEHIND PRINCIPAL SPILLWAY OUTLET STRUCTURE.

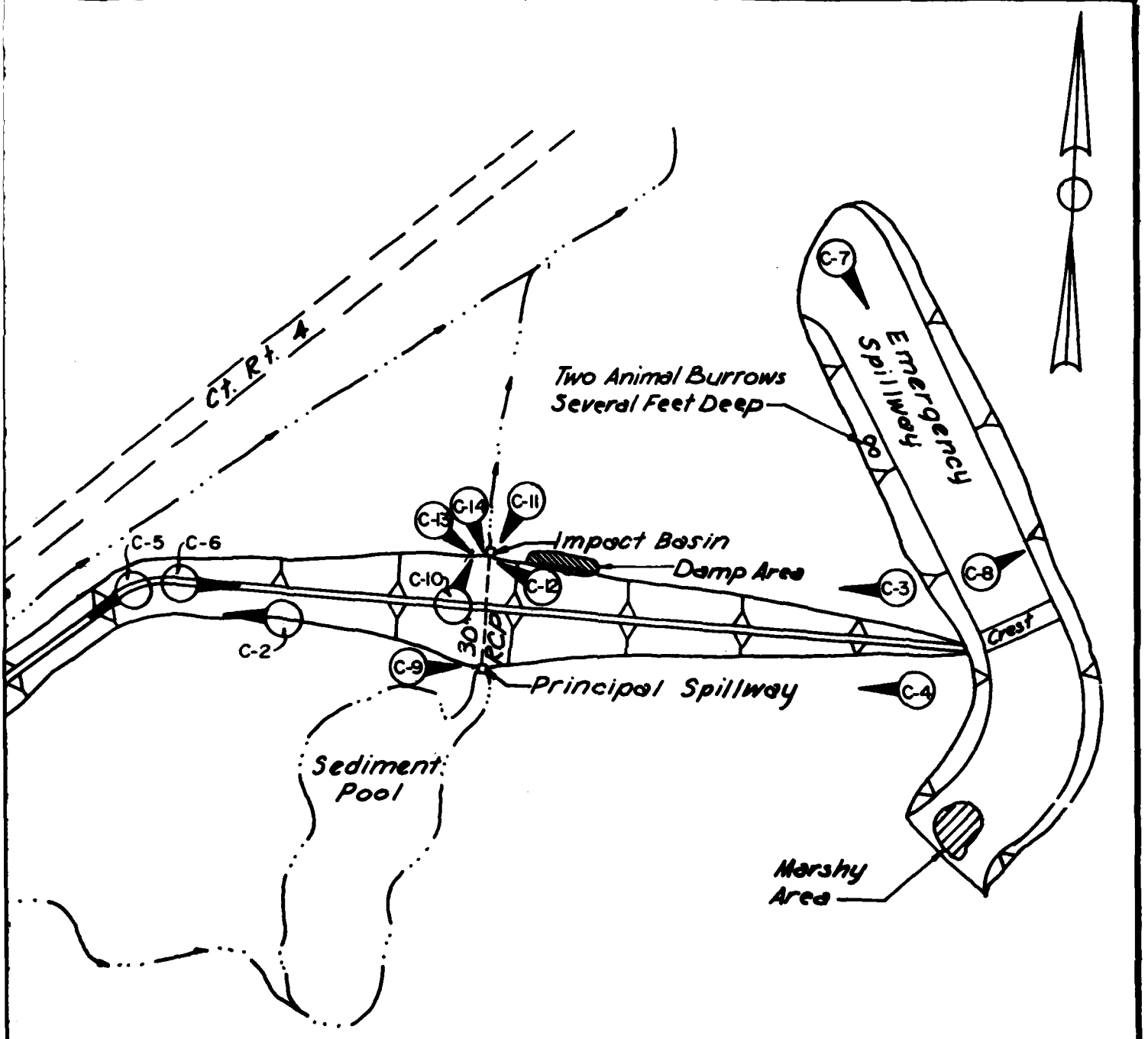
C-14 EROSION ALONG WEST SIDE OF PRINCIPAL SPILLWAY OUTLET STRUCTURE.

C-15 TOP OF DIKE - LOOKING EAST



C-16 VEHICLE PATH ON DOWNSTREAM FACE OF DIKE - LOOKING NORTH.


RESERVOIR SIDE
C-15
C-16
DIKE
C-5
Farmington Avenue
C-1
DAM

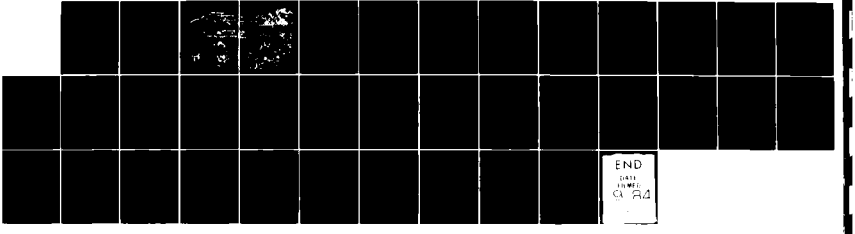


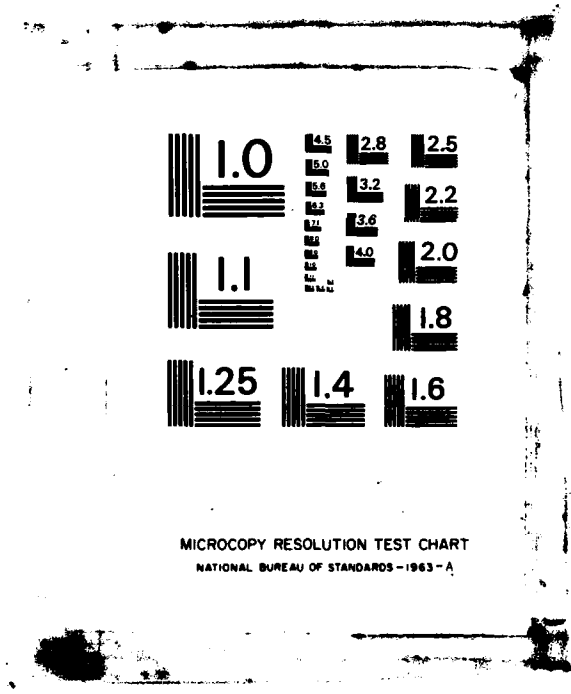
AM

SOUTH RESERVOIR DAM
PHOTO INDEX

AD-A144 544 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS SOUTH RESERVOIR DAM (..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV MAY 81 2/2

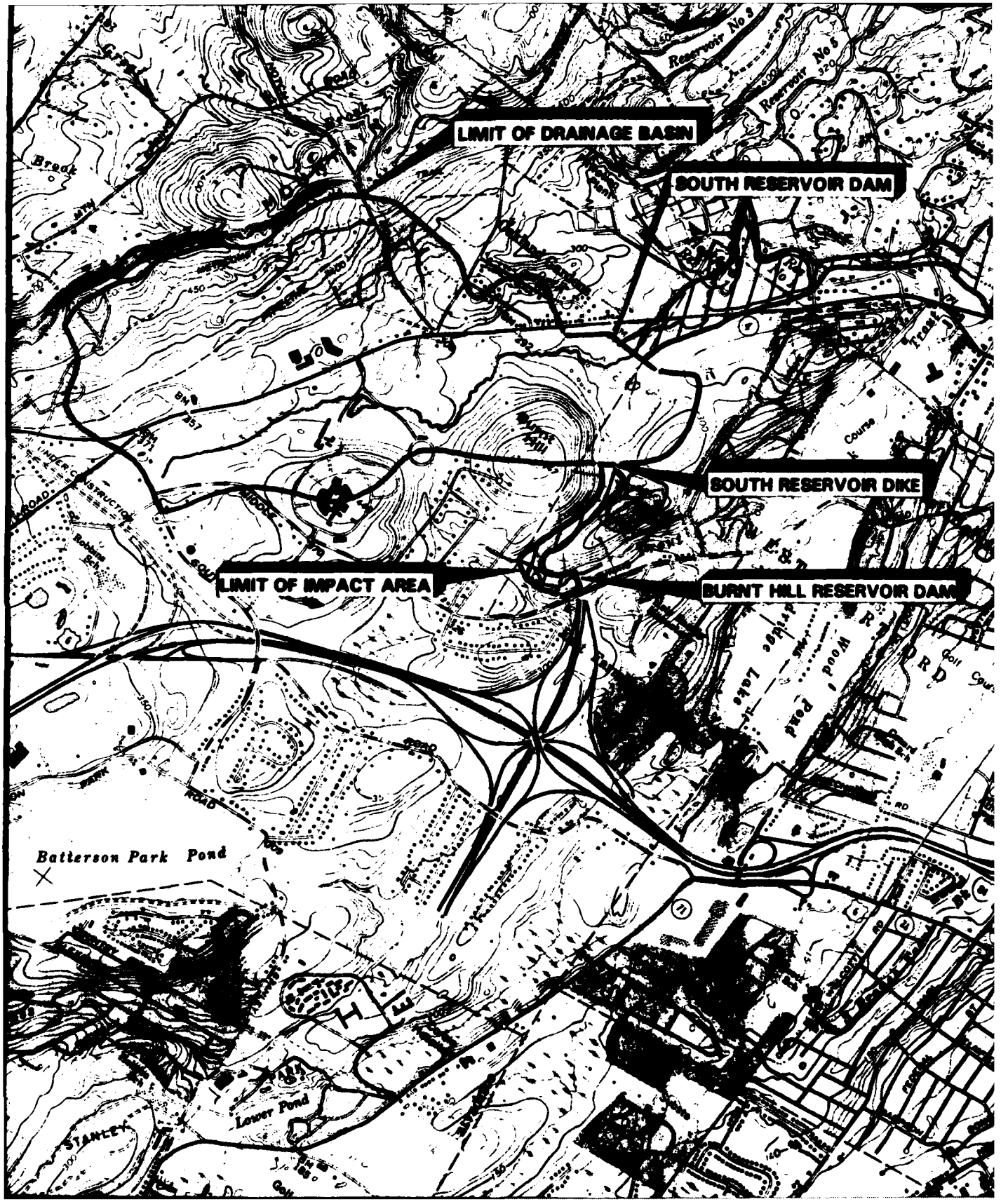
UNCLASSIFIED F/G 13/13 NL

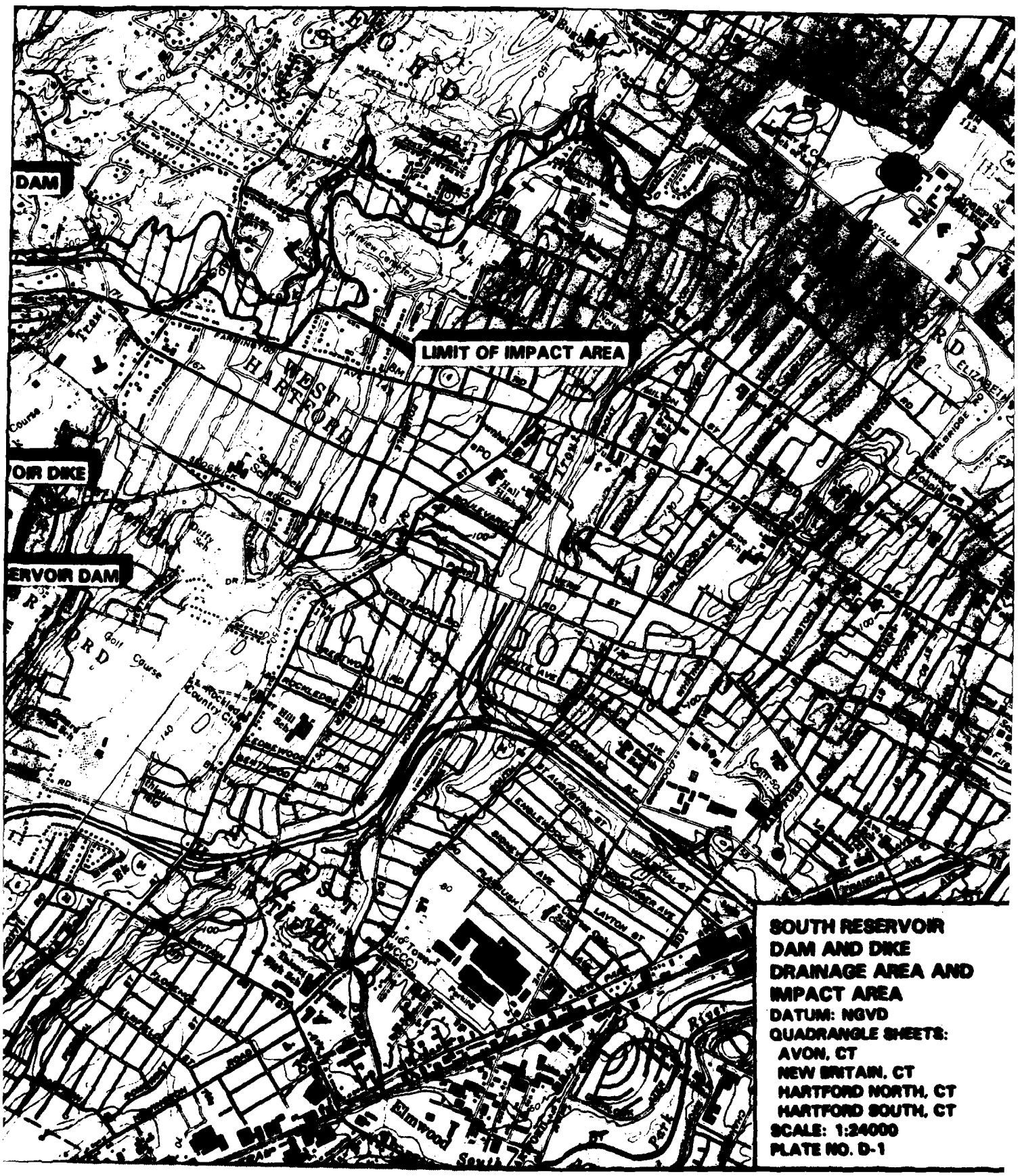



1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS


LIMIT OF DRAINAGE BASIN
SOUTH RESERVOIR DAM
SOUTH RESERVOIR DIKE
LIMIT OF IMPACT AREA
BURNT HILL RESERVOIR DAM
Reservoir No 3
Reservoir No 5
Batterson Park Pond
Lower Pond
Wood Pond
Lakes
STANLEY
ROAD


DAM
LIMIT OF IMPACT AREA
OIR DIKE
ERVOIR DAM
HARTFORD
WEST
Golf Course
Country Club
Elmwood
South
Park
SOUTH RESERVOIR
DAM AND DIKE
DRAINAGE AREA AND
IMPACT AREA
DATUM: NGVD
QUADRANGLE SHEETS:
AVON, CT
NEW BRITAIN, CT
HARTFORD NORTH, CT
HARTFORD SOUTH, CT
SCALE: 1:24000
PLATE NO. D-1

HYDROLOGIC AND HYDRAULIC ANALYSIS
SUMMARY SHEET

Dam South Reservoir

Test Flood PMF

INFLOW HYDROGRAPH DEVELOPMENT

Drainage Area 1.3 sq. mi.

Probable Maximum Precipation
24 hour - 200 square mile PMP 21.5 inches

Initial Railfall Loss 0 Inch
Uniform Railfall loss .1 Inch

Snyder's Lag 2.3 hours
Snyder's Peaking Coefficient .625

Test Flood Inflow 2750 CFS

PMF Inflow 2750 CFS

RESERVOIR ROUTING AND DAM OVERTOPPING

Test Flood Outflow 1934 CFS

Spillway Capacity at Top of Dam 3580 CFS (Both Spillways)
185 % of Test Flood

Flow Over Spillway at Test Flood 1810 CFS (Emergency Spillway)

Spillway Crest Elevation 288.8 Feet (Emergency Spillway)
Top of Dam Elevation 293.4 Feet
Test Flood Elevation 291.8 Feet

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********
    1             A1      DAM SAFETY ANALYSIS - JOB 80-188/05   ERJ
    2             A2      SOUTH RESERVOIR DAM - FARMINGTON, CT.
    3             A3      01-23-81
    4             B    75       1       0       0       0       0       0       2       0       0
    5             B1    5
    6             J     1       2       1
    7             J1   .5     1.0
    8             K               1                                       1
    9             KI      COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH
   10             M     1         1     1.3       0     1.3                                       1
   11             P             21.5     110     124     133     142
   12             T                                                                       .1
   13             M  2.41    .625
   14             X   8.3   40.05     2.8
   15             K     1       1                                       1
   16             KI      ROUTING INFLOW HYDROGRAPH THRU POND - OVERTOPPING ANALYSIS
   17             V                                       1       1
   18             VI    1                                                -265.5
   19             SS    0     0.1    17.4    84.4   196.3   339.9   513.8   721.8   930.8
   20             SE  263     264     270     274     278     282     286     290     294
   21             SS 288.0     130     2.7     1.5  263.75     .62    4.91      .5
   22             SD 293.4     2.7     1.5    3535
   23             K    99
```

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********

RUN  DATE= 82/04/01.
     TIME= 14.49.58.
```

DAM SAFETY ANALYSIS - JOB 80-100/05 ERJ
SOUTH RESERVOIR DAM - FARMINGTON, CT.
01-29-81

JOB SPECIFICATION

NO	NMR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
75	1	0	0	0	0	0	2	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 2 LRTIO= 1

RTIOS= .50 1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

COMPUTATION OF PMF - DEVELOPMENT OF INFLOW HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
2	1	1.30	0.00	1.30	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	110.00	124.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .000

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	0.00	.10	0.00	0.00

UNIT HYDROGRAPH DATA
TP= 2.41   CP= .63   NTA= 0

RECESSION DATA
STRTQ= 2.30   QRCSN= -.05   RTIOR= 2.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 2.77 AND R= 2.17 INTERVALS

UNIT HYDROGRAPH 13 END-OF-PERIOD ORDINATES, LAG= 2.42 HOURS, CP= .63 VOL= 1.00

40.	155.	286.	161.	101.	63.	39.	25.	15.	10.
6.	4.	2.							

END-OF-PERIOD FLOW

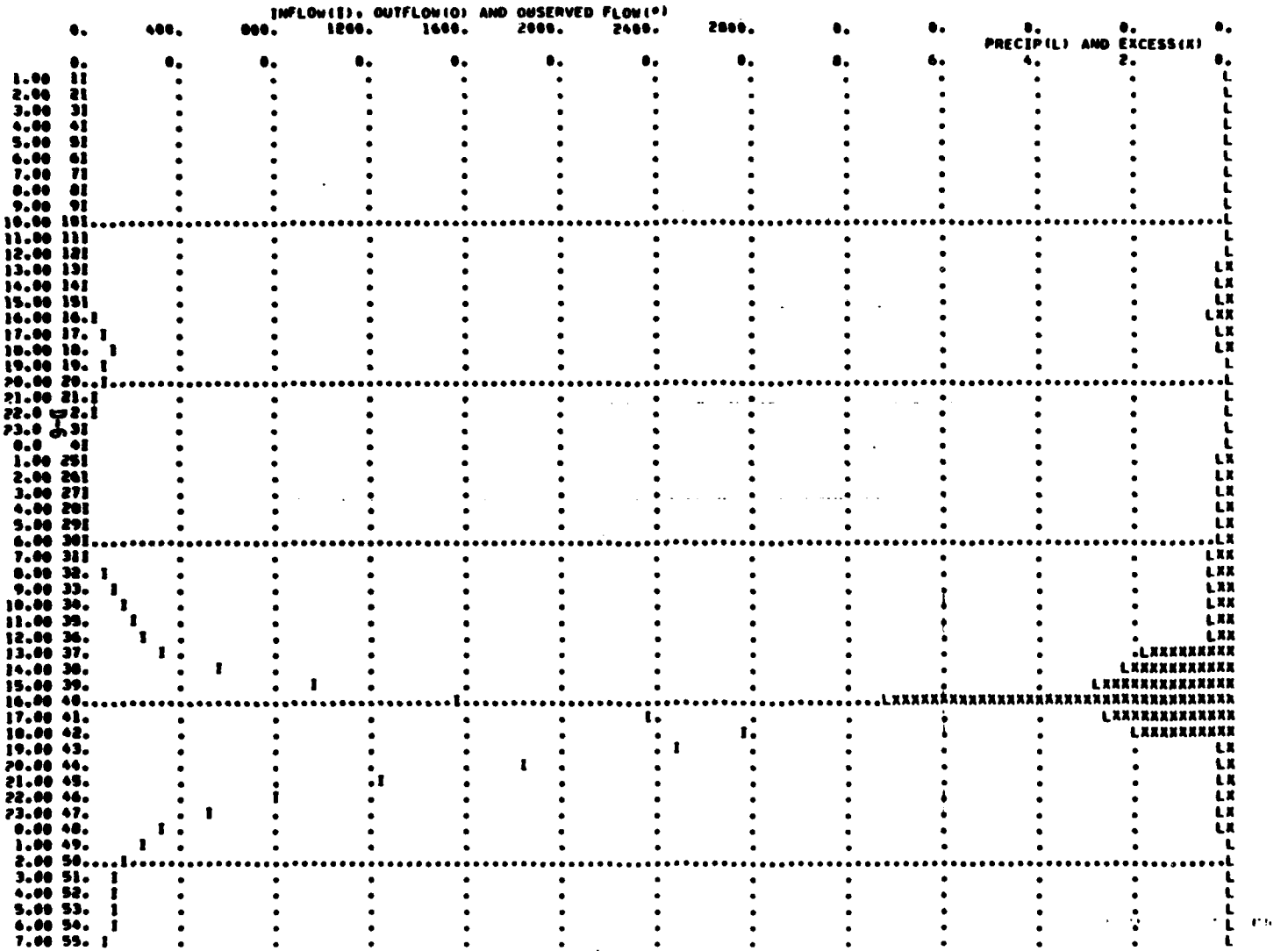
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

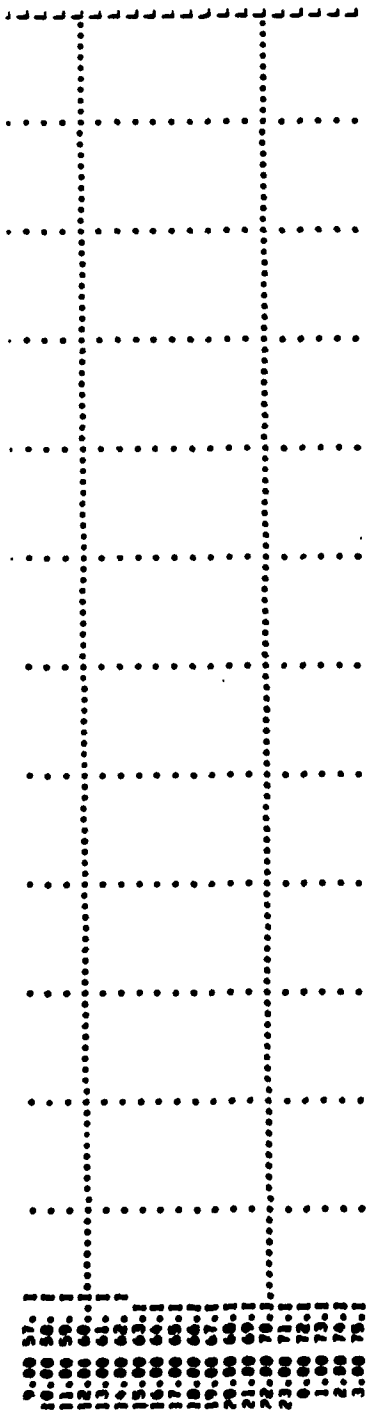
1.01	1.00	1	₺01	0.00	.01	2.	1.02	14.00	38	2.27	2.17	.10	561.
1.01	2.00	2	₺01	0.00	.01	2.	1.02	15.00	39	2.84	2.74	.10	950.
1.01	3.00	3	₺01	0.00	.01	2.	1.02	16.00	40	7.19	7.09	.10	1577.
1.01	4.00	4	₺01	0.00	.01	2.	1.02	17.00	41	2.65	2.55	.10	2360.
1.01	5.00	5	₺01	0.00	.01	2.	1.02	18.00	42	2.08	1.98	.10	2758.
1.01	6.00	6	₺01	0.00	.01	2.	1.02	19.00	43	.15	.05	.10	2477.
1.01	7.00	7	₺03	0.00	.03	1.	1.02	20.00	44	.15	.05	.10	1856.
1.01	8.00	8	₺03	0.00	.03	1.	1.02	21.00	45	.15	.05	.10	1241.
1.01	9.00	9	₺03	0.00	.03	1.	1.02	22.00	46	.15	.05	.10	793.
1.01	10.00	10	₺03	0.00	.03	1.	1.02	23.00	47	.15	.05	.10	513.
1.01	11.00	11	₺03	0.00	.03	1.	1.03	0.00	48	.15	.05	.10	337.
1.01	12.00	12	₺03	0.00	.03	1.	1.03	1.00	49	0.00	0.00	0.00	225.
1.01	13.00	13	₺13	.03	.10	2.	1.03	2.00	50	0.00	0.00	0.00	146.
1.01	14.00	14	₺15	.05	.10	6.	1.03	3.00	51	0.00	0.00	0.00	130.
1.01	15.00	15	₺19	.09	.10	19.	1.03	4.00	52	0.00	0.00	0.00	121.
1.01	16.00	16	₺49	.39	.10	49.	1.03	5.00	53	0.00	0.00	0.00	113.
1.01	17.00	17	₺10	.00	.10	95.	1.03	6.00	54	0.00	0.00	0.00	105.
1.01	18.00	18	₺14	.04	.10	116.	1.03	7.00	55	0.00	0.00	0.00	98.
1.01	19.00	19	₺01	0.00	.01	99.	1.03	8.00	56	0.00	0.00	0.00	92.
1.01	20.00	20	₺01	0.00	.01	69.	1.03	9.00	57	0.00	0.00	0.00	86.
1.01	21.00	21	₺01	0.00	.01	45.	1.03	10.00	58	0.00	0.00	0.00	80.
1.01	22.00	22	₺01	0.00	.01	28.	1.03	11.00	59	0.00	0.00	0.00	74.
1.01	23.00	23	₺01	0.00	.01	18.	1.03	12.00	60	0.00	0.00	0.00	69.
1.02	0.00	24	₺01	0.00	.01	11.	1.03	13.00	61	0.00	0.00	0.00	65.
1.02	1.00	25	₺10	.00	.10	7.	1.03	14.00	62	0.00	0.00	0.00	60.
1.02	2.00	26	₺10	.00	.10	6.	1.03	15.00	63	0.00	0.00	0.00	56.
1.02	3.00	27	.10	.00	.10	5.	1.03	16.00	64	0.00	0.00	0.00	53.
1.02	4.00	28	.10	.00	.10	5.	1.03	17.00	65	0.00	0.00	0.00	49.
1.02	5.00	29	.10	.00	.10	5.	1.03	18.00	66	0.00	0.00	0.00	46.
1.02	6.00	30	₺10	.00	.10	4.	1.03	19.00	67	0.00	0.00	0.00	43.
1.02	7.00	31	₺40	.30	.10	17.	1.03	20.00	68	0.00	0.00	0.00	40.
1.02	8.00	32	₺40	.30	.10	63.	1.03	21.00	69	0.00	0.00	0.00	37.
1.02	9.00	33	₺40	.30	.10	125.	1.03	22.00	70	0.00	0.00	0.00	35.
1.02	10.00	34	₺40	.30	.10	173.	1.03	23.00	71	0.00	0.00	0.00	32.
1.02	11.00	35	₺40	.30	.10	203.	1.04	0.00	72	0.00	0.00	0.00	30.
1.02	12.00	36	₺40	.30	.10	221.	1.04	1.00	73	0.00	0.00	0.00	28.
1.02	13.00	37	1₺09	1.79	.10	305.	1.04	2.00	74	0.00	0.00	0.00	26.
							1.04	3.00	75	0.00	0.00	0.00	25.
									SUM	24.42	21.16	3.27	19103.
										(620.)(	537.)(	83.)(	540.94)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2750.	2020.	720.	265.	19092.
CMS	78.	57.	21.	8.	541.
INCHES		14.45	20.83	22.76	22.77
MM		367.11	529.06	578.22	578.35
AC*FT		1002.	1443.	1578.	1578.
THOUS CU M		1235.	1780.	1946.	1946.

OVF

STATION 1





•OVN•

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	4.	10.	25.	47.	58.	50.	35.
22.	14.	9.	6.	4.	3.	3.	2.	2.	2.
9.	32.	62.	86.	101.	111.	153.	281.	479.	788.
1180.	1375.	1238.	928.	620.	396.	256.	169.	113.	73.
65.	60.	56.	53.	49.	46.	43.	40.	37.	35.
32.	30.	28.	26.	25.	23.	21.	20.	19.	17.
16.	15.	14.	13.	12.					

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1375.	1010.	364.	133.	9546.
CMS	39.	29.	10.	4.	270.
INCHES		7.23	10.41	11.38	11.38
MM		183.56	264.53	289.11	289.17
AC-FT		501.	722.	789.	789.
THOUS CU M		618.	890.	973.	973.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	2.	8.	19.	49.	95.	116.	99.	69.
45.	28.	18.	11.	7.	6.	5.	5.	5.	4.
17.	63.	125.	173.	203.	221.	305.	561.	958.	1577.
2360.	2750.	2477.	1856.	1241.	793.	513.	337.	225.	146.
130.	121.	113.	105.	98.	92.	86.	80.	74.	69.
65.	60.	56.	53.	49.	46.	43.	40.	37.	35.
32.	30.	28.	26.	25.					

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2750.	2020.	728.	265.	19092.
CMS	78.	57.	21.	8.	541.
INCHES		14.45	20.83	22.76	22.77
MM		367.11	529.06	578.22	578.35
AC-FT		1002.	1443.	1578.	1578.
THOUS CU M		1235.	1780.	1946.	1946.

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HYDROGRAPH ROUTING

ROUTING INFLOW HYDROGRAPH THRU POND - OVERTOPPING ANALYSIS

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-266.	0

CAPACITY=	0.	0.	17.	84.	190.	346.	514.	722.	930.
ELEVATION=	263.	266.	270.	274.	278.	282.	286.	290.	294.

288.0	130.0	2.7	1.5	263.8	.6	4.9	.5	

DAM DATA

TOPEL	COOD	EXPD	DAMWID
293.4	2.7	1.5	3535.

STATION 1, PLAN 1, RATIO 1

ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	2	SUB-STEP 1	TIME	2.00 HR	
ESTIMATED W.S. ELEV	2.656E+02	2.638E+02	CONTINUITY BALANCE		3.295E+01	3.174E+00
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	4	SUB-STEP 1	TIME	4.00 HR	
ESTIMATED W.S. ELEV	2.652E+02	2.637E+02	CONTINUITY BALANCE		2.979E+01	-1.263E+00
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	9	SUB-STEP 1	TIME	9.00 HR	
ESTIMATED W.S. ELEV	2.650E+02	2.638E+02	CONTINUITY BALANCE		2.698E+01	2.560E+00
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	11	SUB-STEP 1	TIME	11.00 HR	
ESTIMATED W.S. ELEV	2.644E+02	2.634E+02	CONTINUITY BALANCE		1.935E+01	-7.840E-01
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	12	SUB-STEP 1	TIME	12.00 HR	
ESTIMATED W.S. ELEV	2.647E+02	2.637E+02	CONTINUITY BALANCE		2.369E+01	-7.978E-01
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	13	SUB-STEP 1	TIME	13.00 HR	
ESTIMATED W.S. ELEV	2.637E+02	2.638E+02	CONTINUITY BALANCE		-1.651E+00	3.186E+00
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	14	SUB-STEP 1	TIME	14.00 HR	
ESTIMATED W.S. ELEV	2.642E+02	2.637E+02	CONTINUITY BALANCE		1.693E+01	-4.394E-01
ITERATIVE SOLUTION DID NOT CONVERGE,	PERIOD	29	SUB-STEP 1	TIME	29.00 HR	
ESTIMATED W.S. ELEV	2.638E+02	2.636E+02	CONTINUITY BALANCE		2.964E+00	-1.267E-01

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	5.	0.	0.	2.	0.	2.	0.	4.	0.
0.	0.	5.	0.	13.	21.	30.	40.	42.	42.
40.	37.	0.	14.	0.	6.	0.	5.	0.	5.
6.	33.	30.	43.	49.	55.	61.	65.	72.	81.
91.	99.	107.	112.	115.	117.	117.	118.	118.	118.
118.	117.	117.	117.	117.	116.	116.	116.	115.	115.
115.	114.	114.	113.	113.	113.	112.	112.	111.	111.
110.	110.	109.	109.	108.					

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	2.	3.	3.
2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	4.	8.	12.	18.	31.	57.	103.
177.	275.	374.	455.	509.	542.	559.	567.	569.	567.
563.	558.	553.	548.	543.	537.	531.	525.	519.	512.
505.	499.	492.	484.	477.	470.	462.	455.	447.	440.
432.	424.	416.	408.	400.					

STAGE

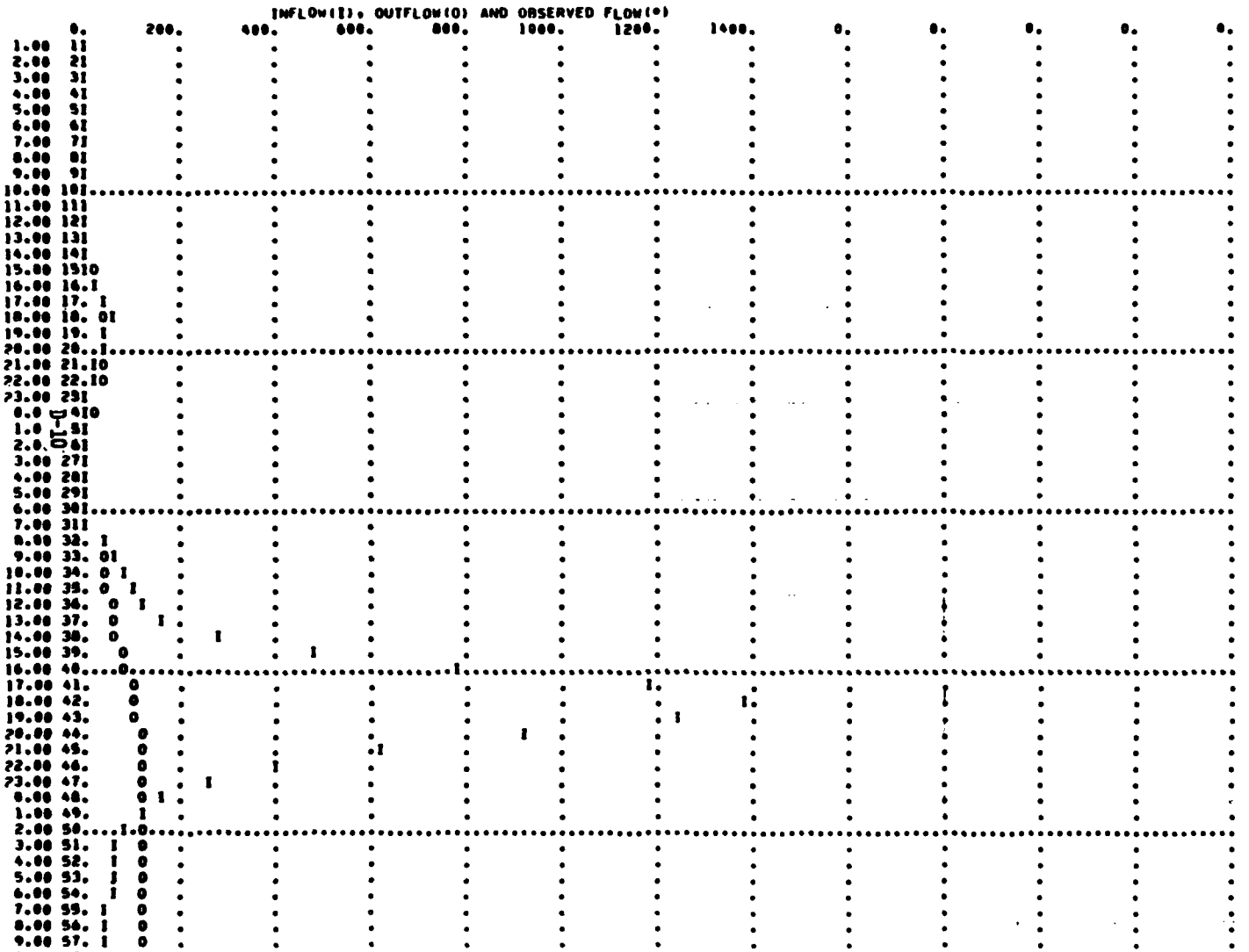
263.0	263.8	263.8	263.7	263.8	263.7	263.8	263.4	263.8	263.8
263.4	263.7	263.8	263.7	264.0	264.5	266.1	266.4	266.6	266.7
266.4	266.0	263.8	264.1	263.8	263.8	263.4	263.8	263.6	263.8
263.8	265.5	266.2	266.9	267.8	268.8	270.1	270.8	272.3	274.7
277.5	280.3	282.8	284.6	285.9	286.5	286.9	287.0	287.1	287.0
286.9	286.9	286.8	286.7	286.6	286.4	286.3	286.2	286.1	286.0
285.8	285.6	285.5	285.3	285.2	285.0	284.8	284.6	284.5	284.3
284.1	283.9	283.8	283.6	283.4					

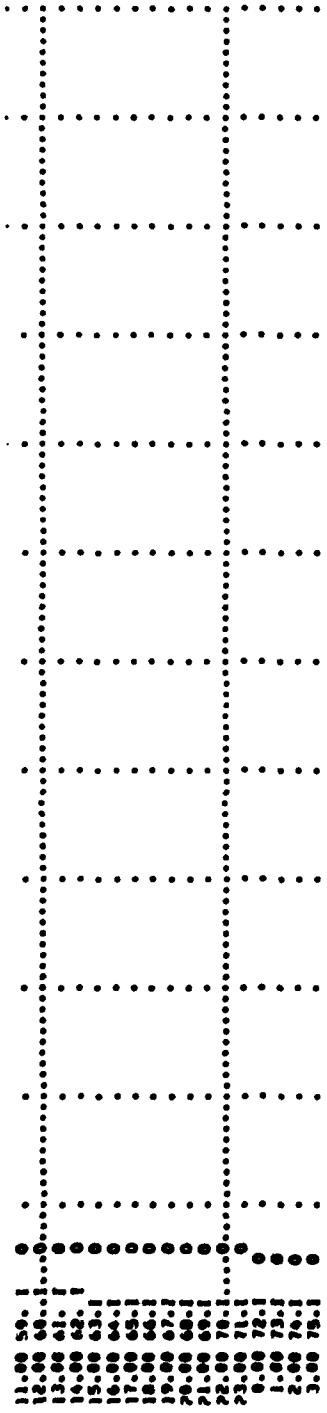
PEAK OUTFLOW IS 118. AT TIME 49.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	118.	118.	115.	65.	4712.
CMS	3.	3.	3.	2.	133.
INCHES		.04	3.31	5.61	5.62
MM		21.38	83.96	142.60	142.74
AC-FT		58.	229.	389.	389.

•OVF•

STATION 1





DVN

STATION 1, PLAN 1, RATIO 2

ITERATIVE SOLUTION DID NOT CONVERGE, PERIOD 3 SUB-STEP 1 TIME 3.00 HR
ESTIMATED W.S. ELEV 2.642E+02 2.637E+02 CONTINUITY BALANCE 1.567E+01 -3.694E-01
ITERATIVE SOLUTION DID NOT CONVERGE, PERIOD 10 SUB-STEP 1 TIME 10.00 HR
ESTIMATED W.S. ELEV 2.637E+02 2.663E+02 CONTINUITY BALANCE -2.036E+00 6.507E+01
ITERATIVE SOLUTION DID NOT CONVERGE, PERIOD 12 SUB-STEP 1 TIME 12.00 HR
ESTIMATED W.S. ELEV 2.656E+02 2.638E+02 CONTINUITY BALANCE 3.295E+01 3.174E+00
ITERATIVE SOLUTION DID NOT CONVERGE, PERIOD 20 SUB-STEP 1 TIME 20.00 HR
ESTIMATED W.S. ELEV 2.640E+02 2.635E+02 CONTINUITY BALANCE 1.156E+01 -4.108E-01

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	4.	0.	4.	8.	3.	0.	3.	0.	39.
0.	5.	0.	9.	17.	38.	42.	50.	56.	58.
58.	56.	53.	49.	44.	39.	18.	0.	9.	0.
21.	38.	45.	56.	63.	66.	78.	78.	86.	96.
108.	119.	1054.	1934.	1616.	1149.	793.	553.	393.	284.
217.	188.	158.	143.	132.	125.	122.	122.	122.	122.
121.	121.	121.	121.	120.	120.	120.	120.	119.	119.
119.	118.	118.	117.	117.					

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
0.	0.	0.	0.	0.	1.	3.	8.	13.	15.
15.	13.	11.	8.	5.	2.	0.	0.	0.	0.
0.	1.	5.	13.	24.	36.	52.	82.	138.	235.
389.	591.	759.	814.	796.	765.	739.	719.	703.	698.
681.	675.	671.	667.	664.	661.	659.	655.	652.	647.
643.	638.	633.	628.	622.	616.	609.	603.	596.	589.
582.	575.	568.	560.	553.					

STAGE

263.0	263.0	263.7	263.8	263.6	263.8	263.6	263.8	263.3	266.3
263.8	263.8	263.8	263.9	264.3	266.1	266.7	267.9	268.9	269.4
269.4	269.8	268.4	267.7	267.8	266.4	263.9	263.5	263.9	263.5
264.5	266.2	267.2	269.1	270.4	271.1	272.1	273.9	276.8	279.2
283.1	287.5	290.7	291.8	291.4	290.8	290.3	289.9	289.6	289.4
289.2	289.1	289.0	288.9	288.9	288.8	288.8	288.7	288.7	288.6
288.5	288.4	288.3	288.2	288.1	288.0	287.8	287.7	287.6	287.5
287.3	287.2	287.0	286.9	286.8					

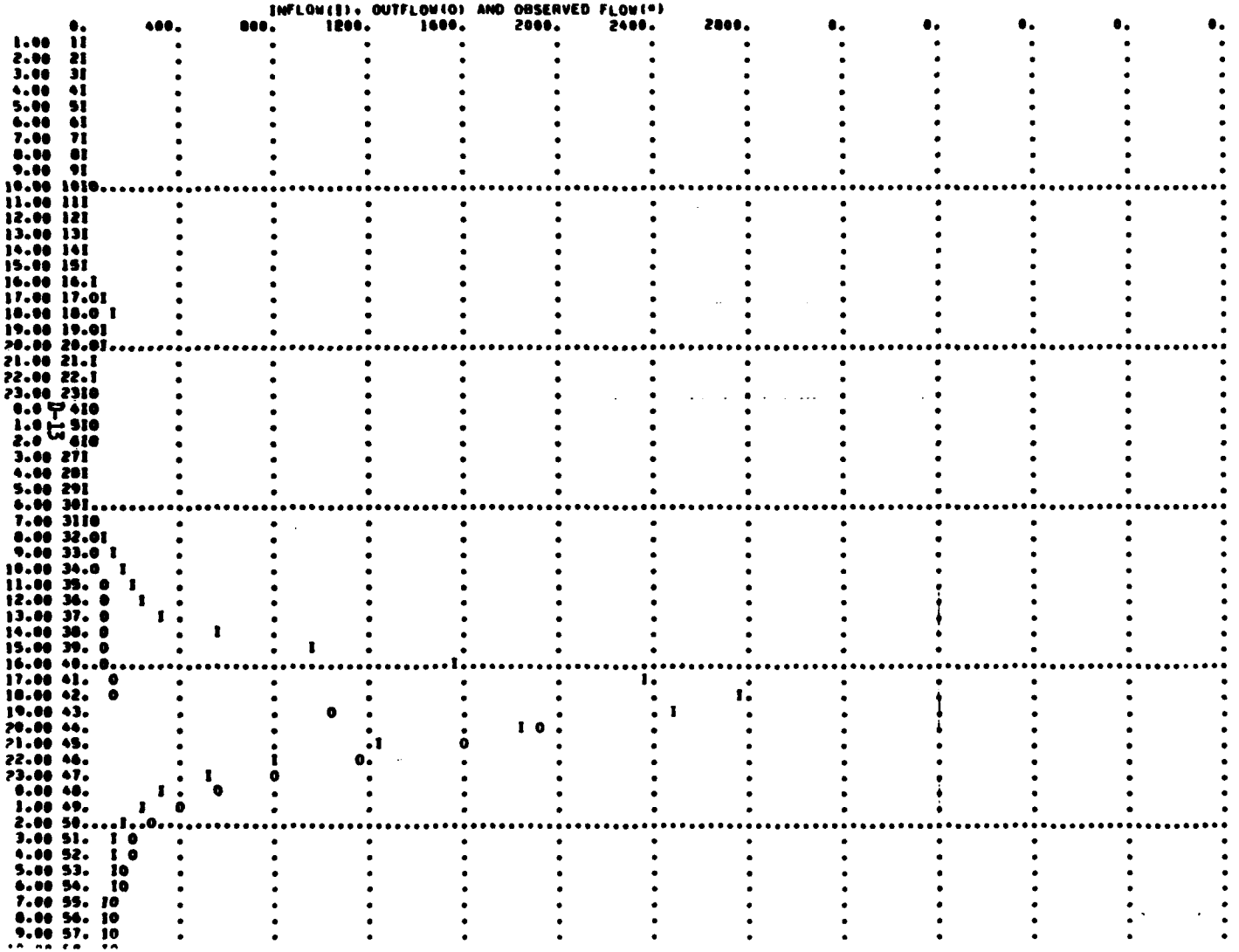
PEAK OUTFLOW IS 1934. AT TIME 44.00 HOURS

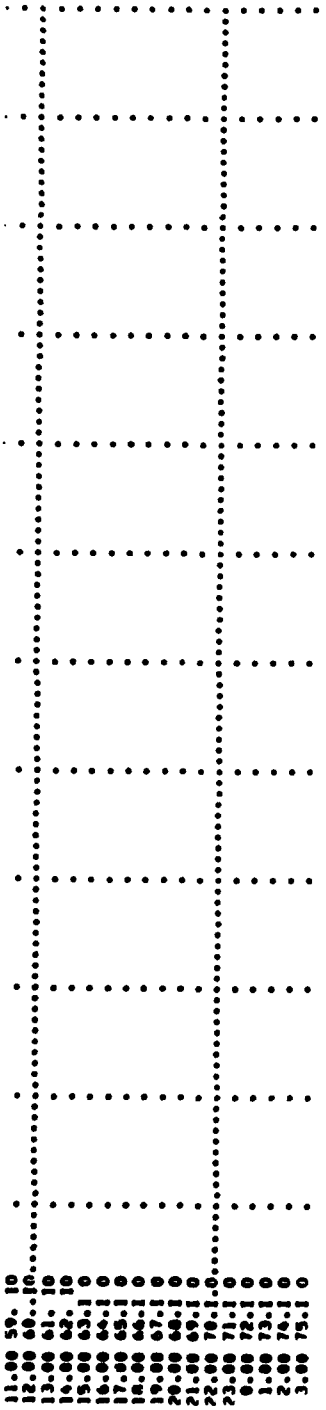
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1934.	1147.	414.	173.	12441.
CMS	55.	32.	12.	5.	352.
INCHES		8.21	11.86	14.83	14.84
MM		208.43	301.15	376.75	376.86
AC-FT		569.	822.	1028.	1028.
THOUS CU M		701.	1013.	1268.	1268.

•OVF•

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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12:00 60. 10
13:00 61. 10
14:00 62. 10
15:00 63.1
16:00 64.1
17:00 65.1
18:00 66.1
19:00 67.1
20:00 68.1
21:00 69.1
22:00 70.1
23:00 71.1
0:00 72.1
1:00 73.1
2:00 74.1
3:00 75.1

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .50	RATIO 2 1.00
HYDROGRAPH AT	1	1.30	1	1375.	2750.
	(	3.37)	(	38.93)(	77.86)(
ROUTED TO	1	1.30	1	118.	1934.
	(	3.37)	(	3.34)(	54.76)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	265.50	288.00	293.40
STORAGE	0.	659.	899.
OUTFLOW	32.	122.	3596.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.50	287.86	0.00	569.	118.	0.00	49.00	0.00
1.00	291.78	0.00	814.	1934.	0.00	44.00	0.00

SOUTH RESERVOIR

DAM

South Reservoir Dam

Dam Failure Analysis

1. Failure discharge with pool at Em.Spillway (elev. 288.8) = 53,000 CFS
2. Depth of water in reservoir at time of failure = 25.8 ft.
3. Maximum depth of flow downstream of dam = 25± ft.
4. Water surface elevation just downstream of dam at time of failure) = 288±

The failure discharge of 53000 CFS will enter and flow downstream 20000 feet until the brook crosses North Main Street. Valley storage in this 20000 feet length of brook is significant in reducing the discharge. Also due to roughness characteristics, obstructions and frictional losses, it is very likely that the unsteady dam failure flow will dissipate its wave and kinetic energy and thus convert to steady and uniform flow obeying Manning's formulae 20000 feet downstream. The failure profile will have the following hydraulic characteristics:

DISTANCE FROM THE DAM	WATER SURFACE ELEVATION	DEPTH (ft.)	REMARKS
0	288.8	25.8	At Dam
400	273.3	13.3	
2900	262.5	4.5	Hartford Res. No. 1
6700	162.1	2.1	
10200	142.6	2.6	
16200	132.2	2.2	
20000	102±	2±	North Main Street

NOTES:

"Rule of Thumb" Guidance for Estimating
Downstream Dam Failure Analysis

DATA

Name of Dam South Reservoir Dam

Location Farmington/West Hartford, Connecticut

Drainage Area 1.3 sq. mi., Top of Dam 293.4

Spillway Type Earth Channel, Crest of Spillway 288.8

Surface Area @ Crest Elev. 64 Acres = 0.1 sq. mi.

Pool Bottom Near Dam = 263.0

Assumed Side Slopes of Embankments = 2H:1V

Depth of Pool at Dam (Yo) = 25.8 Feet

Mid-Height Elev. 275.9

Length of Dam at Crest = 1300* Feet

Length of Dam at Mid-Height = 600 Feet

40% of Dam Length at Mid-Height = W_b = 240 Feet

Step 1

Storage (S) at time of failure 650 Ac-FT

Step 2

Peak Failure Discharge

$Q_{pl} = 8/27\ W_b\ \sqrt{g}\ Yo^{3/2}$

$= (1.68)\ (W_b)\ (Y_o)^{3/2} =$ 53000 cfs

Failure is assumed to coincide with pool elevation at Emergency Spillway Crest

NOTES:

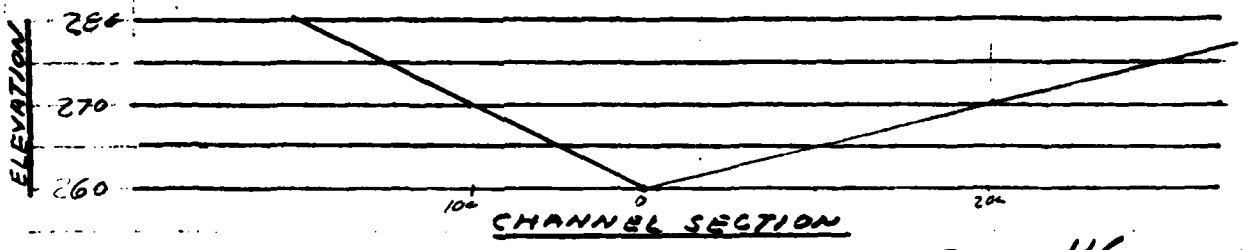
*Length of Dam over principal spillway.

BY JR DATE 1-9-81 SUBJECT DAM INSPECTION STUDY SHEET NO. 1 OF
CHKD. BY EEJ DATE 2-9-81 JOB NO. 80-100/05
DAM FAILURE ANALYSIS
FURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DAM

SECTION 400' DOWNSTREAM

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n =$ .03 SLOPE (S_L) = .009 ft/ft



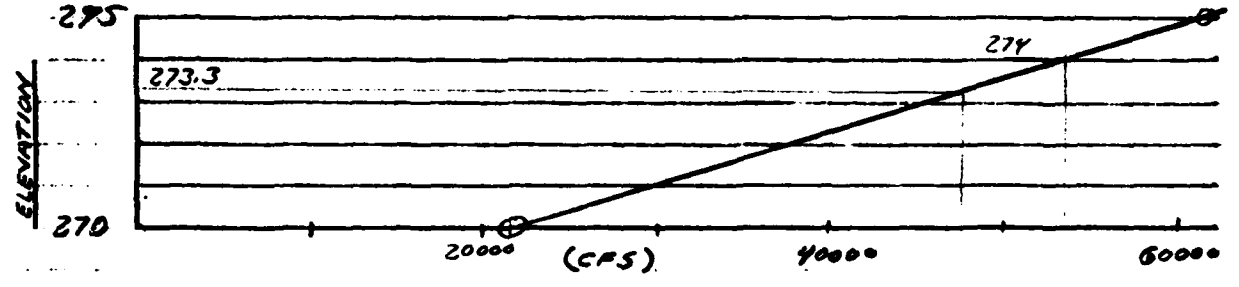
CHANNEL SECTION

Q_{P_1} = 53000 CFS

FULL SPILLWAY Q_s = 116 CFS

TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
270	1500	300	5	21000	10
275	3375	450	7.5	61000	15



$V_1 = \left(\frac{25.8 + 14}{2}\right)\left(\frac{240 + 420}{2}\right)\left(\frac{400}{43560}\right)$ = 60 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 48000 CFS V_{AVG} = 60

$V_2 = \left(\frac{25.8 + 13.3}{2}\right)(3.0)$ = 59 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 48000 CFS ELEV = 273.3

DEPTH = 13.3

FULL SPILLWAY DEPTH = 2

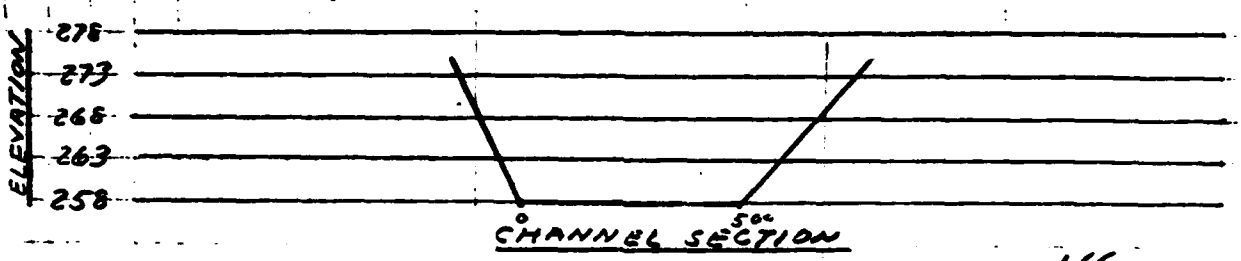
INCREASE DUE TO DAM FAILURE = 11.3

BY JR DATE 1-12-81 SUBJECT DAM INSPECTION STUDY SHEET NO. 7 OF
CHKD. BY EJT DATE 2-9-81 DAM FAILURE ANALYSIS JOB NO. 80-100/05
FURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DAM

SECTION 2900' DOWNSTREAM (HARTFORD RES. NO. 1)

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE (S_L) = .005

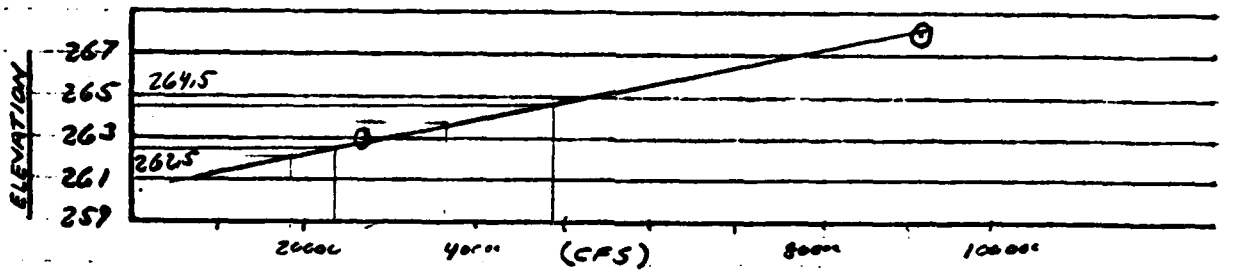


Q_{P_1} = 48000 CFS

FULL SPILLWAY Q_s = 116 CFS

TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
263	2575	650	4.4	27000	5
268	6500	800	8.1	92000	10



$V_1 = \left(\frac{12.0 + 6.5}{2}\right)\left(\frac{580}{2} + \frac{650+500}{2}\right)\left(\frac{3600}{43560}\right)\left(\frac{1}{2}\right)$ = 342 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 23000 CFS V_{AVG} = 324

$V_2 = \left(\frac{12.0 + 4.5}{2}\right)(37.\ )$ = 305 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 24000 CFS ELEV. = 262.5

DEPTH = 4.5

FULL SPILLWAY Δ DEPTH = 0

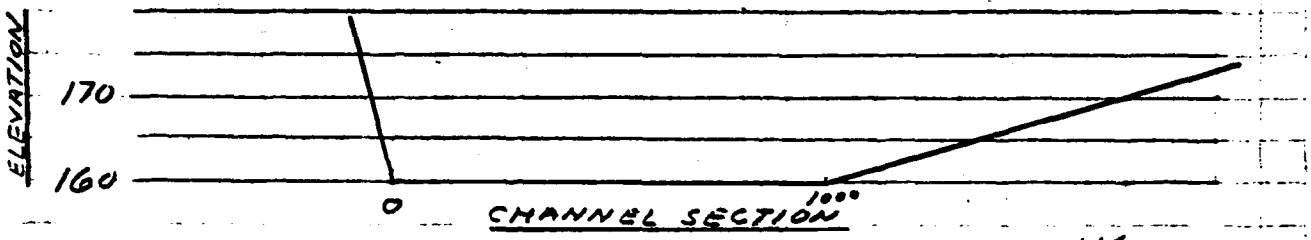
INCREASE DUE TO DAM FAILURE = 4.5

BY JR DATE 12/4/80 SUBJECT DAM INSPECTION STUDY SHEET NO. ____ OF ____
CHKD. BY ERJ DATE 2/10/81 JOB NO. 80-100/05
DAM FAILURE ANALYSIS
PURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DAM

SECTION 6700' DOWNSTREAM

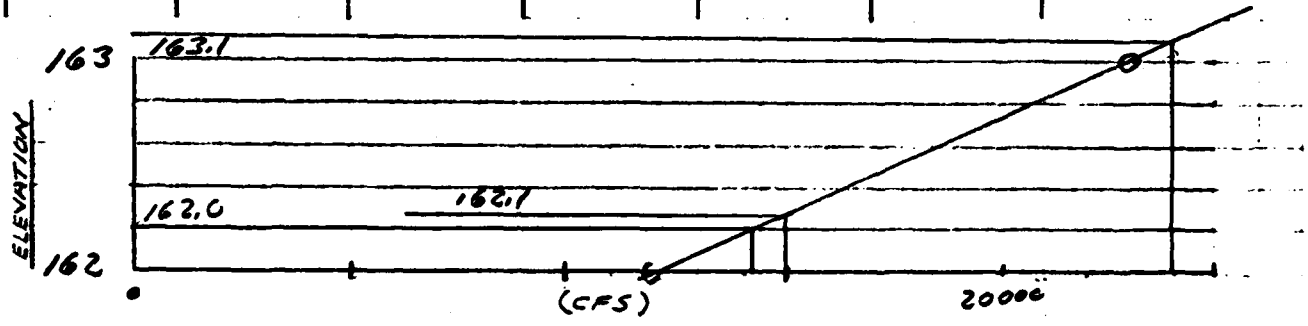
USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE (S_L) = .0053 ft/ft



FULL SPILLWAY Q_s = 116 CFS

Q_{P_1} = 24000 CFS TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
163	3225	1150	2.8	23000	3
162	2100	1100	1.9	12000	2



$V_1 = \left(\frac{4.5 + 3.1}{2}\right)\left(\frac{500}{1} + \frac{1150+1100}{2}\right)\left(\frac{3800}{43560}\right)\left(\frac{1}{2}\right)$ = 261 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 14000 CFS V_{AVG} = 243

$V_2 = \left(\frac{4.5 + 2.0}{2}\right)(69)$ = 224 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 15000 CFS ELEV = 162.1

DEPTH = 2.1

FULL SPILLWAY : DEPTH = 0

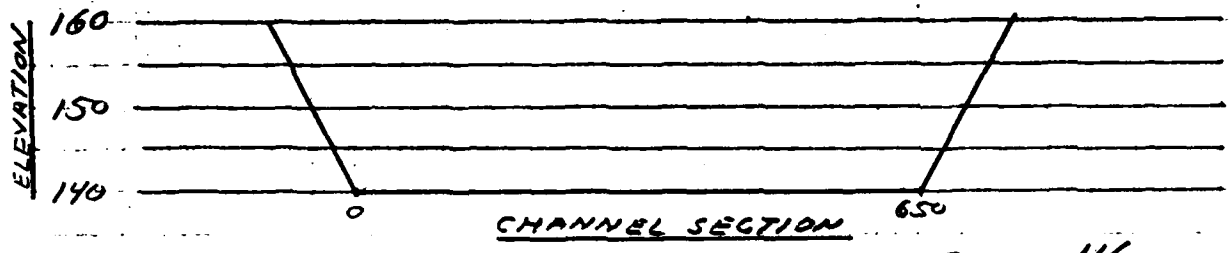
INCREASE DUE TO DAM FAILURE = 2.1

BY JR DATE 12/4/80 SUBJECT DAM INSPECTION STUDY SHEET NO. ..... OF .....
CHKD. BY ERJ DATE 2/10/81 JOB NO. 80-100/05
DAM FAILURE ANALYSIS
PURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DAM

SECTION 10200' DOWNSTREAM

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n =$ .03 SLOPE (S_L) = .005 ft/ft

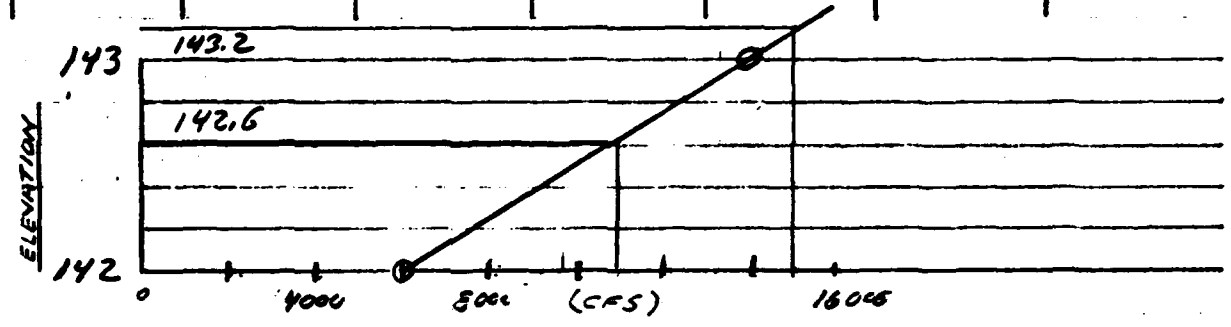


CHANNEL SECTION

FULL SPILLWAY Q_s = 116 CFS

Q_{P_1} = 15000 CFS TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
143	1950	650	3	14000	3
145	3250	650	5	33000	5
142	1300	650	2	7000	2



$V_1 = \left(\frac{2.1 + 3.2}{2}\right)\left(\frac{1100+1000}{2} + \frac{650}{1}\right)\left(\frac{3500}{43560}\right)\left(\frac{1}{2}\right)$ = 181 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 11000 CFS V_{AVG} = 171

$V_2 = \left(\frac{2.1 + 2.6}{2}\right)(68)$ = 160 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 11000 CFS ELEV = 142.6

DEPTH = 2.6

FULL SPILLWAY : DEPTH = 0

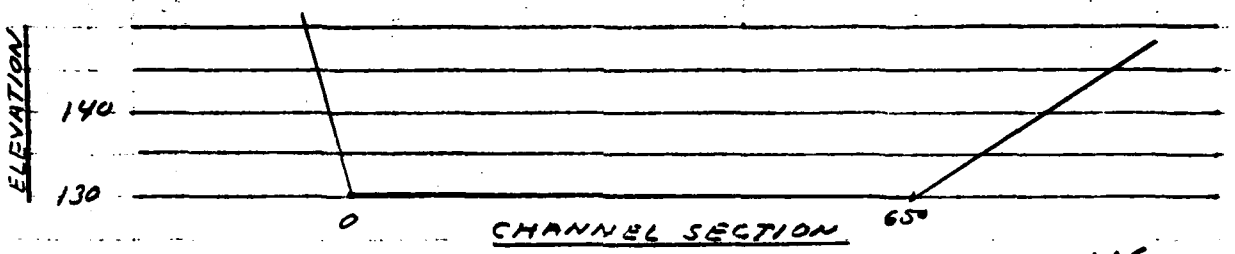
INCREASE DUE TO DAM FAILURE = 2.6

BY JR DATE 12/4/80 SUBJECT DAM INSPECTION STUDY SHEET NO. ____ OF ____
CHKD. BY ERJ DATE 2/10/81 JOB NO. 80-100/05
DAM FAILURE ANALYSIS
PURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DAM

SECTION 16200' DOWNSTREAM

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .103$ SLOPE (S_L) = .004 ft/ft

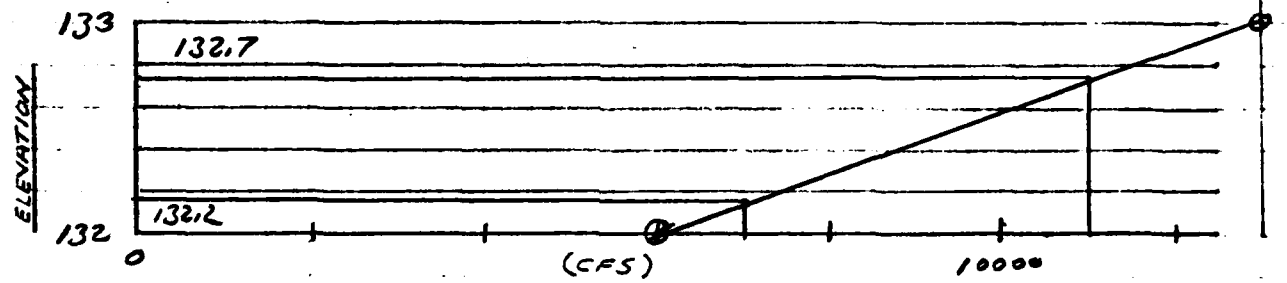


CHANNEL SECTION

FULL SPILLWAY Q_s = 116 CFS

Q_{P_1} = 11000 CFS TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
132	1300	650	2	6000	2
133	1950	650	3	13000	3



$V_1 = \left(\frac{2.6 + 2.7}{2}\right)\left(\frac{650}{1} + \frac{650}{1}\right)\left(\frac{6000}{43560}\right)\left(\frac{1}{2}\right)$ = 237 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 7000 CFS V_{AVG} = 225

$V_2 = \left(\frac{2.6 + 2.2}{2}\right)(89)$ = 213 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 7000 CFS ELEV = 132.2

DEPTH = 2.2

FULL SPILLWAY : DEPTH = 0

INCREASE DUE TO DAM FAILURE = 2.2

South Reservoir Dam

A. Size Classification

Height of dam = 30.9 ft.; hence Small

Storage capacity at top of dam (elev. 293.4) = 900 AC-FT.; hence Small

Adopted size classification: Small

B.i) Hazard Potential

Numerous homes and buildings may suffer excessive damage and there is the potential for the loss of more than a few lives in the event of dam failure.

Adopted hazard classification: High

ii) Impact of Failure of Dam with pool at Emergency Spillway Crest.

It is estimated from the "rule of thumb" failure hydrograph, that the following adverse impacts are a possibility by the failure of this dam.

a) Loss of homes Numerous;
b) Loss of buildings Numerous;
c) Loss of highways or roads 7;
d) Loss of bridges 7;

The failure profile can affect a distance of 20000+ feet from the dam.

C. Hazard Potential Classifications

HAZARD	SIZE	TEST FLOOD RANGE
High	Small	1/2 PMF to PMF

Adopted Test Flood = PMF = 2110 CSM

= 2750 CFS

D. Overtopping Potential

Drainage Area 830 acres = 1.3 sq. miles

Spillway crest elevation = 288.8

Top of Dam Elevation = 293.4

Maximum spillway discharge

Capacity without overtopping of dam = 3580 CFS
"test flood" inflow discharge = 2750 CFS
"test flood" outflow discharge = 1934 CFS

SOUTH RESERVOIR

Dike

South Reservoir Dike

Dam Failure Analysis

1. Failure discharge with pool at Em. Spillway (elev. 288.8) = 15600 CFS
2. Depth of water in reservoir at time of failure = 23.8 ft.
3. Maximum depth of flow downstream of dam = 23± ft.
4. Water surface elevation just downstream of dam at time of failure) = 288±

The failure discharge of 15600 CFS will enter and flow downstream 3000 feet until the brook enters the Burnt Hill Reservoir. Valley storage in this 3000 feet length of brook is not significant in reducing the discharge. The Burnt Hill Reservoir will not contain the failure flow and the Dam will be overtopped. The failure profile will have the following hydraulic characteristics:

DISTANCE FROM THE DAM	WATER SURFACE ELEVATION	DEPTH (ft.)	REMARKS
0	288.8	23.8	At Dam
300	277.0*	7.0	
1600	266.3*	6.3	
3000	272.7	29.5	Burnt Hill Res.

NOTES:

*The effect of backwater from the Burnt Hill Reservoir has not been considered in this analysis.

"Rule of Thumb" Guidance for Estimating
Downstream Dam Failure Analysis

DATA

Name of Dam South Reservoir Dike

Location West Hartford, Connecticut

Drainage Area 1.3 sq. mi., Top of Dam 293.4

Spillway Type None, Crest of Spillway 288.8*

Surface Area @ Crest Elev. 64 Acres = 0.1 sq. mi.

Pool Bottom Near Dam = 265

Assumed Side Slopes of Embankments = 2H:1V

Depth of Pool at Dam (Yo) = 23.8 Feet

Mid-Height Elev. 276.9

Length of Dam at Crest = 475 Feet

Length of Dam at Mid-Height = 200 Feet

40 % of Dam Length at Mid-Height = W_b = 80 Feet

Step 1

Storage (S) at time of failure 650 Ac-FT

Step 2

Peak Failure Discharge

$Q_{pl} = 8/27\ W_b\ \sqrt{g}\ Yo^{3/2}$

$= (1.68)\ (W_b)\ (Y_o)^{3/2} =$ 15600 cfs

Failure is assumed to coincide with pool elevation at Emergency Spillway Crest of the Dam.

NOTES:

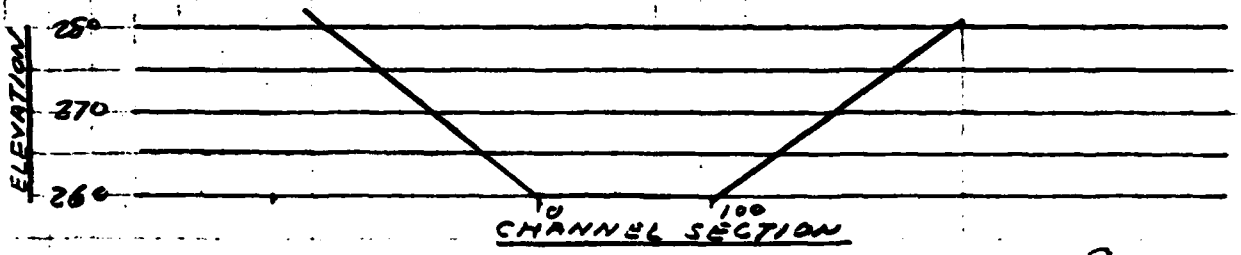
*Crest of the Emergency Spillway of the Dam.

BY JR DATE 12/4/84 SUBJECT DAM INSPECTION STUDY SHEET NO. 2 OF 2
CHKD. BY RJ DATE 2/9/84 JOB NO. 80-100/05
DAM FAILURE ANALYSIS
PURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DIKE

SECTION 1600' DOWNSTREAM

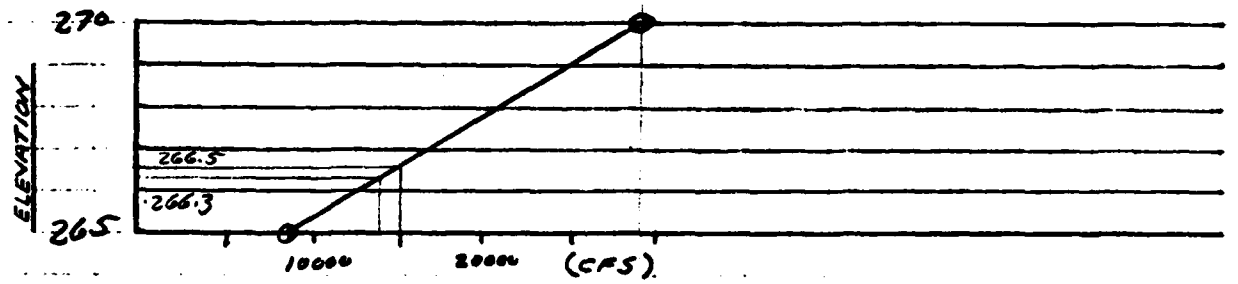
USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE (S_L) = .0087 ft/ft



FULL SPILLWAY Q_s = 0 CFS

Q_{P_1} = 15000 CFS TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
265	675	170	4.0	8000	5'
270	1700	240	7.1	29000	10'



$V_1 = \left(\frac{7.0 + 6.5}{2}\right)\left(\frac{260 + 190}{2}\right)\left(\frac{1300}{43560}\right)$ = 45 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S)$ = 14000 CFS V_{AVG} = 45

$V_2 = \left(\frac{7.0 + 6.3}{2}\right)(6.7)$ = 45 AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S)$ = 14000 CFS ELEV = 266.3

DEPTH = 6.3

FULL SPILLWAY DEPTH = 0

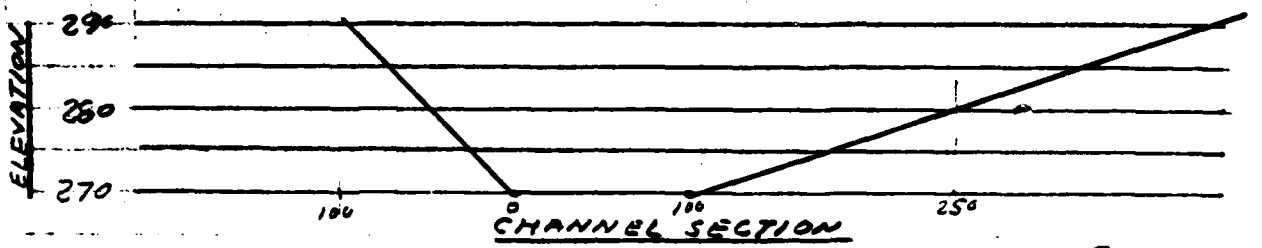
INCREASE DUE TO DAM FAILURE = 6.3

BY JR DATE 12/4/80 SUBJECT DAM INSPECTION STUDY SHEET NO. 1 OF 2
CHKD. BY ERT DATE 2/2/81 DAM FAILURE ANALYSIS JOB NO. 80-100/05
PURCELL ASSOCIATES ENGINEERS • ARCHITECTS • PLANNERS

DAM SOUTH RESERVOIR DIKE

SECTION 300' DOWNSTREAM

USING $Q = \frac{1.486}{n} A R^{2/3} S_L^{1/2}$ $n = .03$ SLOPE $(S_L) = .007$ ft/ft

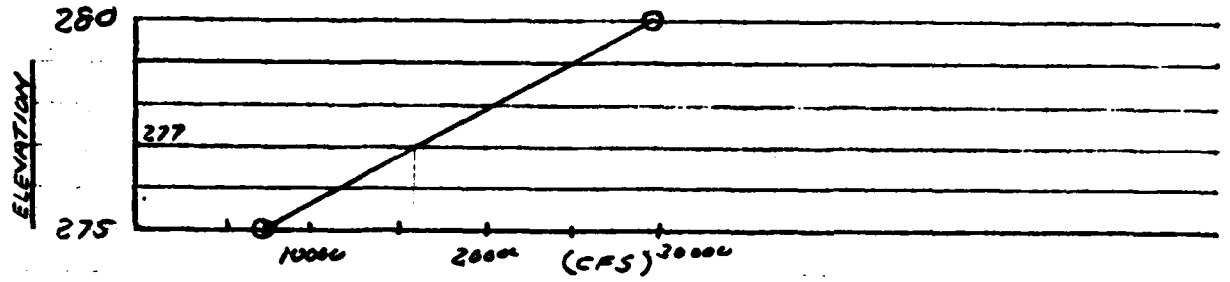


$Q_{P_1} = 15600$ CFS

FULL SPILLWAY $Q_s = 0$ CFS

TOTAL STORAGE (S) = 650 AC-FT

ELEV	AREA	WP	R	Q	DEPTH
275	750	200	3.75	7500	5
280	2000	300	6.7	29000	10



$V_1 = \left(\frac{23.8 + 7.0}{2}\right)\left(\frac{80 + 260}{2}\right)\left(\frac{300}{43560}\right) = 18$ AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_1/S) = 15000$ CFS $V_{AVG} = 18$

$V_2 = \left(\frac{23.8 + 7.0}{2}\right)(1.2) = 18$ AC-FT

$Q_{P_2} = Q_{P_1}(1 - V_{AVG}/S) = 15000$ CFS ELEV = 277.0

DEPTH = 7.0

FULL SPILLWAY DEPTH = 0

INCREASE DUE TO DAM FAILURE = 7.0

South Reservoir Dike

A. Size Classification

Height of dam = 28.4 ft.; hence Small

Storage capacity at top of dam (elev. 293.4) = 900 AC-FT.; hence Small

Adopted size classification: Small

B.i) Hazard Potential

Numerous homes and buildings may suffer excessive damage and there is the potential for the loss of more than a few lives. The downstream Burnt Hill Reservoir Dam would be overtopped in the event of dike failure.

Adopted hazard classification: High

ii) Impact of Failure of Dam with pool at Emergency Spillway Crest.

It is estimated from the "rule of thumb" failure hydrograph, that the following adverse impacts are a possibility by the failure of this dam.

a) Loss of homes More than 4;
b) Loss of buildings Unknown;
c) Loss of highways or roads Unknown;
d) Loss of bridges Unknown;

The failure profile can affect a distance of 3000+ feet from the dam.

C. Hazard Potential Classifications

HAZARD	SIZE	TEST FLOOD RANGE
High	Small	1/2 PMF to PMF

Adopted Test Flood = PMF = 2110 CSM

= 2750 CFS

D. Overtopping Potential

Drainage Area 830 acres = 1.3 sq. miles

Spillway crest elevation = N/A

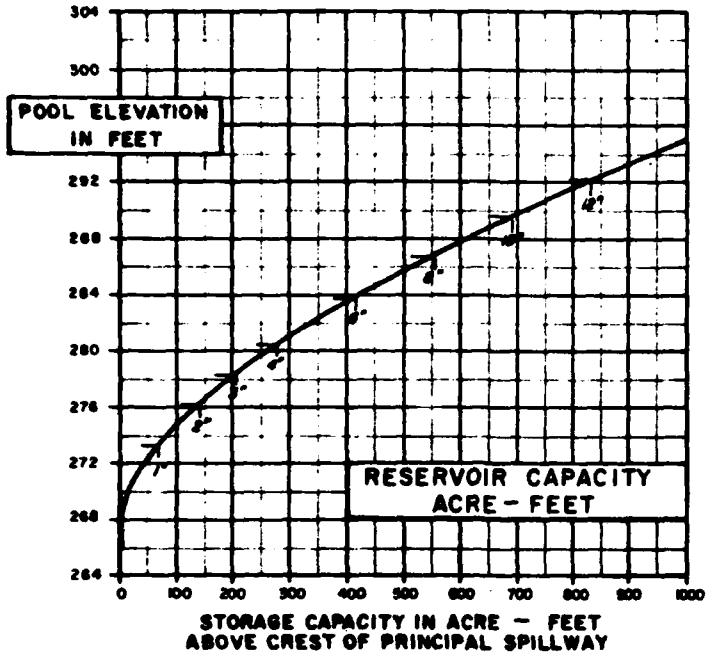
Top of Dam Elevation = 293.4

Maximum spillway discharge

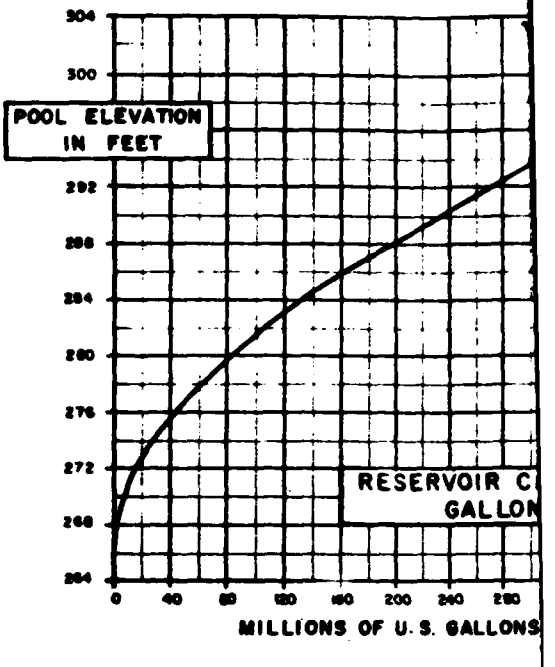
Capacity without overtopping of dam = N/A CFS
"test flood" inflow discharge = 2750 CFS
"test flood" outflow discharge = 1934 (from Dam) CFS

RESERVOIR OPE

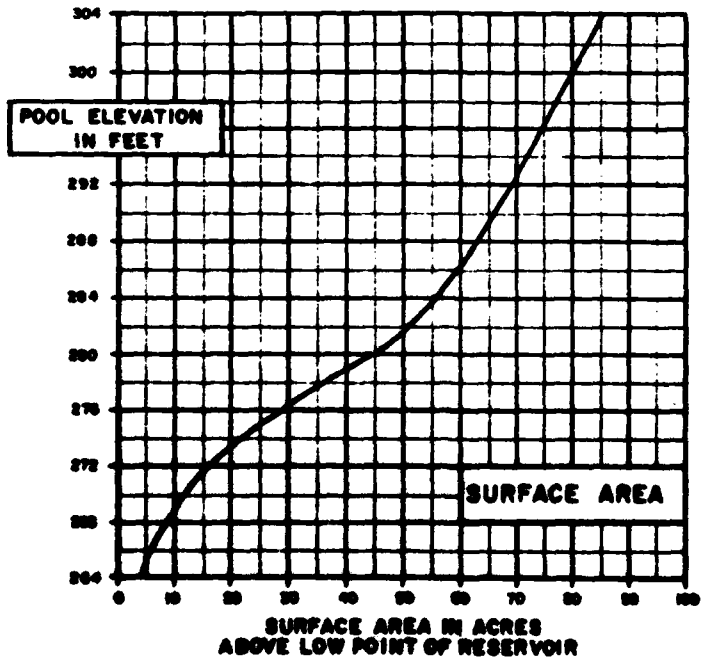
SOUTH RESERVOIR - WATER SUPPLY BROOK -



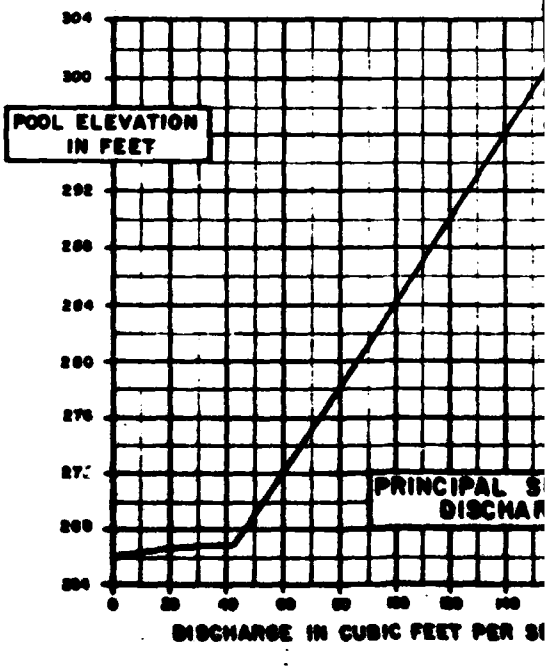
STORAGE CAPACITY IN ACRE - FEET
ABOVE CREST OF PRINCIPAL SPILLWAY



MILLIONS OF U.S. GALLONS



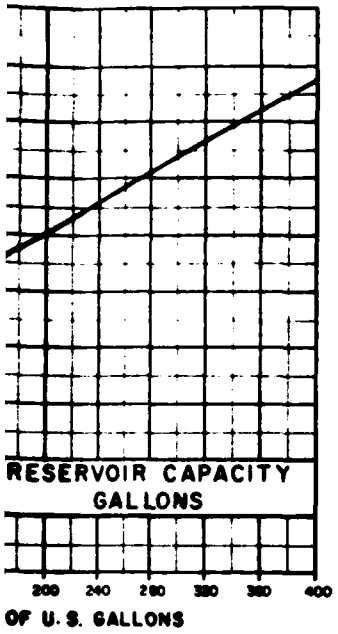
SURFACE AREA IN ACRES
ABOVE LOW POINT OF RESERVOIR

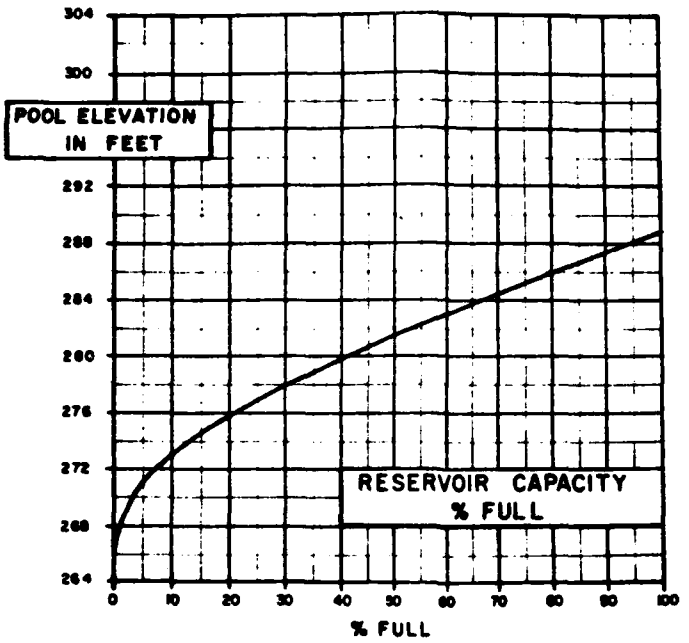


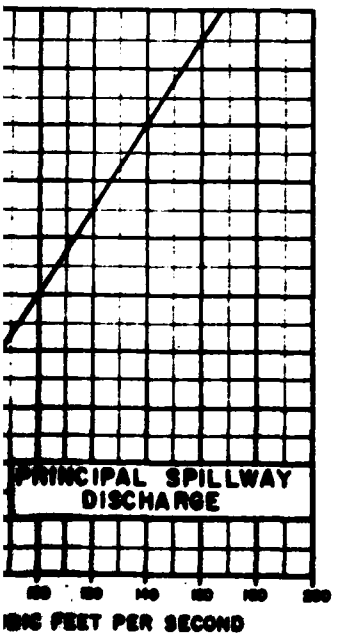
DISCHARGE IN CUBIC FEET PER S

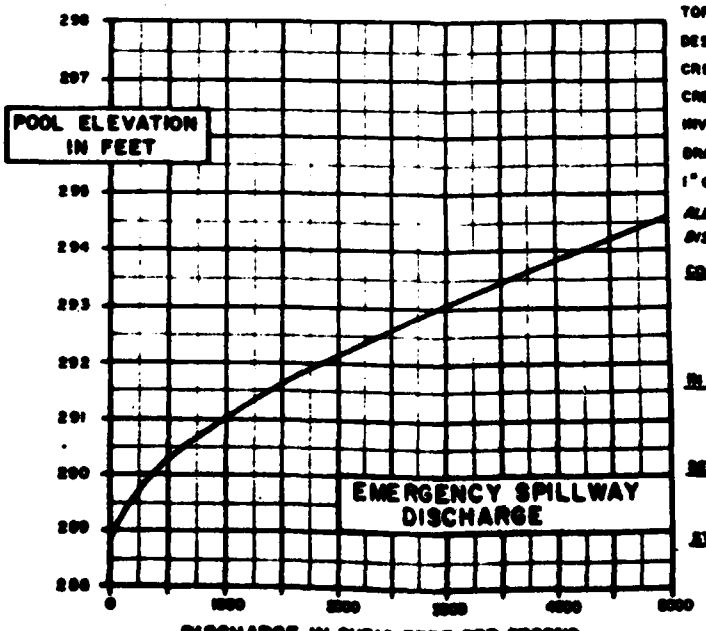
OPERATION DATA

BROOK – SOUTH BRANCH PARK RIVER WATERSHED









PERTINENT DATA

TOP OF DAM	EL	293.4
DESIGN HIGH WATER	EL.	291.4
CREST EMERGENCY SPILLWAY	EL	288.0
CREST PRINCIPAL SPILLWAY	EL	286.9
INVERT LOW FLOW ORIFICE	EL	——
DRAINAGE AREA CONTROLLED	1.30	SQ.MI.

1" OF RUNOFF = 69.33 ACRE-FEET

ALL ELEVATIONS REFER TO METROPOLITAN DISTRICT DATUM

CONSTRUCTED BY:
STATE OF CONNECTICUT
DEPARTMENT OF AGRICULTURE & NATURAL RESOURCES
JOSEPH N GILL, COMMISSIONER

IN ASSOCIATION WITH THE:
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
PUBLIC LAW 566 FUNDS

DESIGNED BY:
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

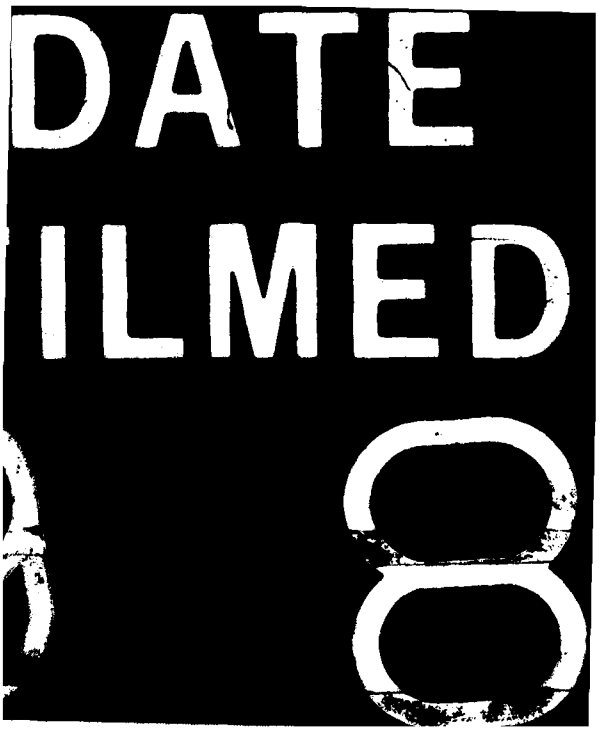
STATUS:
COMPLETED OCTOBER 31, 1964

Anderson-Nichols Associates February 1967

APPENDIX E

INFORMATION AS CONTAINED IN THE

NATIONAL INVENTORY OF DAMS


DATE
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